# THE BUILDER

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# THE BUILDER

*A RECORD OF ARCHITECTURE AND CONSTRUCTION.*

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## LONDON.

THE paper which Sir Aston Webb read before the Geographical Society in January has formed the basis for much discussion and has served more than anything else to give the public a clear and concise epitome of problems which must be effectually met and solved unless we are willing to wait until they grow very much bigger and will have to be solved at a cost to future generations compared with which what we should have to pay now would be trifling. The adoption of Wren's fine scheme for the replanning of London would have given us the nucleus of one of the finest conceptions of a city ever suggested; it would have facilitated traffic, relieved congestion, and by the proposed placing of the chief buildings of London given them the fullest architectural value, but the great opportunity was missed through the narrow views of those in authority and the weight given to personal considerations. But the growth of London is now so rapid and the interests concerned are so great that a failure to deal with its problems as a whole immediately after the war will prove one of the most costly follies ever perpetrated by a community.

We have frequently during the last few years felt compelled to protest against the tendencies shown to interfere with private enterprise and to fetter personal initiative in fields which they are fitted adequately to deal with; but on the other hand, the planning and development of our cities is a matter which cannot be left to chance and must be wisely dealt with by public authorities having the requisite knowledge and power. The organisation of a city's development, like that of an army, is impossible without authority, though the problem is even greater, because we have so long failed to recognise the paramount importance of the subject and its bearing on our lives, while the strife which has gone on between nations has been so constant that military science has been the subject of continuous study. The function of authorities, whether national or municipal, is to do what cannot be done by individuals, and then to leave the people unfettered by interference to contribute their quota to the sum of national effort by pursuing their avocations unhampered by restrictions or the burden of unnecessary taxation.

Sir Aston Webb's paper mainly dealt with the history of the great roads, round the interlacing junction of which London gradually grew, and the enormous congestion which has resulted because the effects of growth were never considered or provided for, so that in dealing with these questions now existing interests and buildings have in many cases to be interfered with; but such interference is small when compared to what would have to be done if we neglect the problem now, in which case we should be in the position of a physician who waited until a patient's illness had reached a dangerous stage before prescribing for him. The difficulty has been that London must be considered as a whole, and with all its numerous authorities there is no one body which has both the extended province and administrative authority necessary to take the requisite steps to have improvements carried out, in addition to which our people have usually been inert in the face of large issues till circumstances have necessitated their being dealt with—usually hurriedly and at enormous cost and sacrifice to the whole community. With the tragic lesson before our eyes of what unpreparedness to meet a menace which all thinking men could foresee has cost Europe, we cannot afford to neglect thinking out solutions for the problems which peace will bring with it, and one of the greatest of these is the future development of our great towns and centres of industry.

A telling picture of the manner in which London was invaded by the railway companies in the nineteenth century, and the way æsthetic and practical interests have been sacrificed in the past, was given in the paper, and here again the necessity of control and of thought was emphasised. If London is to be a city worthy of the Empire of which it is the great nerve centre, it is not too much to say that the various railway interests must be co-ordinated and considered as one integral whole, that many of the terminal stations which disfigure the heart of London must be rebuilt in better positions, and that the intermediate space must be traversed by convenient avenues of underground and electrically actuated railways, and in this connection we should consider the relative advantages of tramways, motor 'buses and other means of communication. The distribution of parks and open spaces, and the provision of new ones in other districts, was also dealt with in the course of one of the ablest statements which we have ever read on the future needs of Greater London.

Sir Aston Webb did not deal with these matters as a theorist, but with the knowledge which a long and intimate study of London has given him, coupled with the results obtained by the compilation of the London Society's map, which has been the work of a well-organised committee, and the preparation of which has cost over £1,000, collected by voluntary contribution. Much of the work given has been voluntary, and what has been paid for has gone to assist those of the profession who have been hard put to it by the results of the war. It is not too much to say that had the work which has been carried out by the London Society been done by a Government Department it would be considered to be cheaply purchased if it had involved a charge of £20,000 on the national funds. Like the great trading companies which flourished from the sixteenth to the eighteenth century and laid the foundations of our world-wide commerce without cost to the State, the London Society has by its energy, enthusiasm and insight done what no other body has attempted, and laid a sure foundation on which the solution of one of the greatest of post-war problems must be dealt with. They are worthy of a general support which we hope will be accorded to them in the richest and most influential of the world's cities, and we hope their claims will not be overlooked by many men of wealth who wish to put it to public uses. Their action over Charing Cross Bridge is fresh in our minds, and we may be sure that if during the turmoil of this titanic conflict they succeeded in enlisting public support, they will be able to do even more in the coming era of peace. The Society has been fortunate in obtaining the invaluable help of Sir Aston Webb, whose opinions are given the deserved consideration of one who does not allow himself to be drawn by enthusiasm into positions which cannot be maintained with reason, and we are not surprised that his paper proved one of the most enthusiastically received expressions of opinion ever given in London.

Lord Plymouth, as President of the Society, has also done much to further its aims, and his knowledge and sympathy with architecture and the conduct of public administration have been very useful assets. As Lord Windsor he was known as one of the most learned among amateurs of matters connected with architecture, and for the services he rendered to public causes in Cardiff wherever they touched on architecture and art, while his experience as First Commissioner of Works enables him to realise the forces which have to be dealt with and overcome where great improvements are in question. But the effective work done by the London Society during the first years of its existence, which have been such troublous ones, can only be accounted for by the enthusiastic support it has received both from architects and the public, to whom it provides a platform on which they can work together for the good of the community.

# NOTES.

**By whose Authority?**

GOVERNMENT Departments seem to have unlimited supplies of stationery and to be exempted from any necessity to practise the economy which politicians delight in advocating before the public. We have before us a form which is being sent in duplicate to all architects, who are invited to state how many bricks, cubic feet of stone, standards of timber, tons of Portland cement, thousands of slates or tiles, superficial feet of glass, tons of lead and asphalt, &c., will be needed in erecting buildings which the architect has in contemplation after the war. The locality and description of buildings is to be stated, also whether it is "to the national advantage that the buildings should be erected without delay." The most curious feature of this astounding document is that it is stated in a letter issued with it to have been prepared "in consultation with the R.I.B.A." There are three possible explanations of this: (*a*) That such consultation took place before the R.I.B.A. was committed to a protest against the proposal to continue war restriction of building after the conclusion of peace; (*b*) that the statement is erroneous and that no such consultation and agreement took place; or (*c*) that the President and Council have acted in the teeth of the expressed wishes of the general body as expressed in a formal resolution. If, as we hope is not the case, this should prove to be so, we hope that a vote of censure will be passed at a business meeting, and that the Council of the Institute will resign and leave the conduct of affairs to others with more constitutional ideas on the exercise of authority.

**Architects and the Memorandum of the Ministry of Reconstruction.**

WE ask all members of the Institute to inquire into the conduct of the governing body in the matter we have mentioned. We also suggest that they should abstain from filling in the forms supplied until the Government, which is in office "to carry through the war" and not to decide whether building is to be controlled after the war or not. After an affirmative decision has been given, and then only, do we consider the Ministry of Reconstruction entitled to the returns they have asked for. The country is, if we are not mistaken, heartily tired of the results of the extension of bureaucracy, which they have only acquiesced in for a great patriotic end in a life and death struggle. It is illogical to fight for the freedom of Europe and at the same time to consent to the establishment of Prussian methods here; it is also doubtful whether we are so entirely convinced of the omniscience and wisdom of those in authority as to be willing to see war powers made permanent in the coming days of peace. We submit that the chief need of the country when peace comes will be the reduction of official departments to a peace footing, the avoidance of unnecessary taxation, and the restoration of the normal freedom of the people.

**A Superfluity.**

We are sorry that at any time, and more especially now, anyone should propose to spend £600,000 on a War Museum, and that the proposal should be adopted. In our view such a collection will serve no useful purpose and within a few years of its erection will, we believe, be found to be the whitest of all white elephants. There are many useful things which might be done with £600,000; and if we look upon the present war as a great human calamity, such a sum might form a capital sum the interest of which should be expended in prizes to be given yearly to inventors of new weapons and means of offence, the possession of which would render war impossible. If practicable means, for instance, could be found for igniting all explosives within a radius of fifty miles by some chemical means, nations would find it impossible to use modern weapons of offence, and navies and armies would cease to have an object; and there are many other ways in which science might render such catastrophes as the present impossible for the future. We do not believe the museum, if built, will be visited by military students or by scientists, but simply by a continually lessening stream of the curious and the idle; and we do not believe it will do anything to stimulate patriotism or encourage national effort. Still, if there is to be a building, we hope it will be a fine one and will be the work of our greatest designer, whoever he may be.

**State Assistance for Housing.**

THE circular issued by the Local Government Board shows a lamentable want of any desire on the part of the authorities to stimulate the natural operation of the law of demand and supply, and is, apparently, designed with the object of making housing impossible except as a State or municipal undertaking. The Government is to relieve local authorities by a grant equal to 75 per cent. of the estimated deficit on loan charges occasioned by the difficulty of obtaining an economic rent. Why rents should not be raised sufficiently to meet the increased cost of housing does not appear to be clear, for the bulk of those to be housed are in receipt of weekly wages and the rate of wages is presumably governed in a large measure by the cost of living, while that cost is made up of the cost of food, rent and other items. The next proposal will, we suppose, be that the working classes shall be supplied with food at certain fixed rates, and any excess over these rates shall be borne by the State, *i.e.*, by those who pay income tax. The proposals of our financial experts are, in brief, that a bonus shall be given to two classes in the community: first, to the workers in the shape of uneconomic rents, and secondly, to those who employ them, whose rates of payment will naturally be proportionate to the demands made upon the working classes in the shape of the cost of necessaries; and all who do not belong to these classes will have to pay the deficit in the shape of imperial or of local taxation! Meantime, the private builder who speculates will be forced to seek other occupations or join the great body of the unemployed, who will presumably be added to the dependents of the State. And not a word is vouchsafed about the repeal of the iniquitous clauses in the Finance Act of 1909, though that Act is the source of much of the difficulty under which the community labours.

**Some Picture Exhibitions.**

AT the "Twenty-one" Gallery in the Adelphi a number of delightful etchings by the late Edgar Wood are on view which will delight all who like to see effects of buildings well handled. Nothing could be better than the little view of Shoreham seen across a stretch of water in the foreground, or the "Three Kentish Maids," a picturesque group of oast-houses. The subjects chosen are mostly from the lower reaches of the Thames and show a wonderful mastery in seizing effects of foreground and distance. The water-colour drawings of M. Theodore Roussel are not so striking, but some very fine lithographs by the artist show his skill and power of draughtsmanship. At the Leicester Galleries a very fine collection of oil and water-colour drawings by Mr. D. Murray Smith, A.R.W.S., are on view, among the best of which are "Mellow Sunlight" (No. 115), "The Farm on the Hill" (No. 125), and the "Sand Pit Farm" (No. 130). All are excellent examples of the artist's ability in depicting delicate detail without losing broad, harmonious effects. The water-colour drawings of Mr. Frederic Whiting at the same gallery are extremely strong and vigorous and are instinct with life and action. A collection of drawings of life and character by Mr. George Belcher, made for *Punch* and *The Tatler*, are also shown in this very interesting collection. The exhibition of the Royal Society of British Artists is not as good as usual, though there is much excellent work in the north-west gallery, among which we may mention "Lengthening Shadows" (No. 8), by Mr. Hely Smith, and two fine decorative studies by Mr. J. Littlejohns, while Mr. Enraght Moony sends three curious studies, which are exhibited in the north-west gallery, in which a Japanese convention has been adopted. Among the works exhibited in the central gallery, are a water-colour entitled "The Platelayers," by Mr. Frank Brangwyn (No. 175), a fine oil colour painting of cliff and sea, entitled "The Ensign," by Mr. A. H. Elphinstone (No. 180), and two fine landscapes by Mr. Charles Clifford.

# FUEL ECONOMY IN COOKING APPARATUS.*

## LECTURE II.

TOWARDS the close of the last lecture we considered generally the theory of the efficiency of various cooking plant, and discussed the question of characteristic curves. We shall now consider present-day cooking plant somewhat more in detail with a view to determining the points where waste of heat takes place in practice. Subsequently we shall consider practical remedies for the defects to be discussed now.

### Loss Involved in Burning Fuel.

Let us briefly consider the amount of the loss necessarily involved due to the burning of the fuel, so as to determine the extreme limit of efficiency which can conceivably be obtained, not from any practical plant such as we know, but from an ideal or perfect plant, such as does not and cannot exist in reality.

The efficiency of any process involving combustion of fuel either solid or gaseous is essentially limited by the fact that we cannot in practice utilise the heat of waste gases at a temperature below the maximum required for the operation in question. In the present case, when the products of combustion have had all the heat taken out of them until they are reduced to 500 degs., they must then be thrown away into the open air and the heat they carry with them wasted, because no heat can be communicated from gases at a lower temperature to an oven or anything else at a higher one. Unless, therefore, we can employ the gases below that temperature for other secondary operations which may be satisfactorily conducted below that lower temperature, such, for instance, as warming water or gentle boiling, or keeping things warm, we have no alternative but to throw the gases away along with the heat they contain. But any such secondary use ought not to affect the question of primary efficiency. In ordinary cooking operations we may fix the necessary temperature to be attained at 450 degs. There are few such operations which cannot be performed at this temperature or a lower one. The highest ever required is, I believe, in the neighbourhood of 500 degs. or perhaps certain baking processes require 550 degs. The volume of the gases absolutely necessary to burn 1 lb. of fuel is about 250 cubic feet, calculated at 500 degs. F. A fire has to be very carefully used or the volume will be more than double of this; an ordinary range uses from four to ten times as much. The result is that we have to deal with a great volume of hot air containing a great deal of heat at a low temperature, which we cannot use and which we must, therefore, throw away. This is the principal cause of waste of heat and is entailed upon us by the fact that we cannot extract energy from a fuel without burning it.

If, then, we reject the gases at a temperature of 500 degs., we may perhaps reckon that in so doing we have necessarily lost at least 20 per cent. of the total theoretical value of the fuel. This is the minimum possible waste. As I shall presently show, the actual waste due to this cause is enormously greater than this. This leaves us with only 80 per cent. of that value available *in the most favourable possible conditions*, even assuming that we use what is left in the best conceivable way. This may perhaps be taken as the utmost efficiency practically attainable by any practical process involving combustion.

### Losses of Fuel Involved in Electrical Cookery.

Considering the other process, which consists in converting the energy into electrical power and so utilising it, there are, in addition to the losses arising from combustion, those arising from the inefficiency of the engine generating the power. Briefly, the best attainable result up to the present in the transformation of the heat in fuel into mechanical power does not exceed about 40 per cent., and the actual figure is commonly far below that. The usual figure is about 15 per cent. Thus, if we even utilise in the most ideal possible manner the whole of the electrical energy so generated, we are still at the very best faced with a loss of 60 per cent and usually of 85 per cent. of the heat in the fuel. It is important to remember that the maximum possible efficiency is, in the present state of knowledge, only 40 per cent. of the fuel used, because of the inefficiency of our present methods of generating power.

Comparing these two processes further, it is found that, for reasons which will be subsequently explained, of the total electrical energy supplied for cooking apparatus, a good deal less *need* be wasted than is practically necessary in the case of direct heating, that is, by heat derived from the combustion of fuel either solid, liquid or gaseous. We can apply electrically derived heat to cooking much more directly and much less wastefully than we can fire heat. It may well prove that this practical advantage will, in many cases, more than compensate in practice for the great loss in the generation of the power to which attention has already been called. Bad as it is, it may indeed prove, even as things are now, to be the cheapest way to apply the heat to cooking, to convert it first into electrical energy.

### Losses Occasioned by Kitchen Range.

Until we have considered exactly how this escape of heat arises in oven cooking apparatus at present in use for solid and gaseous fuel, we shall not be in a position to appreciate the exact degree of importance of the losses.

Consider first an ordinary kitchen range of the closed type, of which a diagram is given (Fig. 4).

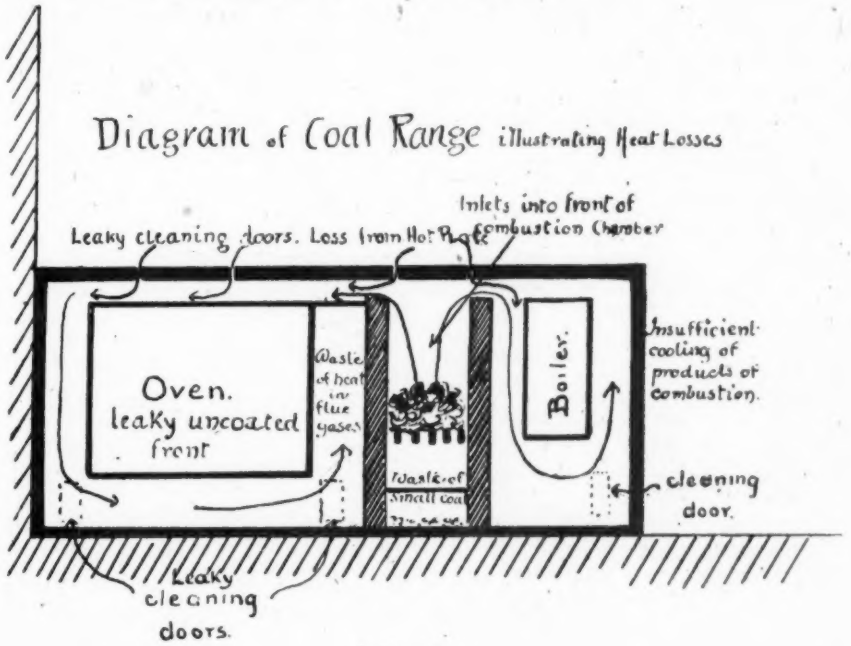


Diagram of Coal Range illustrating Heat Losses
Inlets into front of Combustion Chamber
Leaky cleaning doors. Loss from Hot Plate
Oven. leaky uncoated front
Waste of heat in flue gases
Boiler
Insufficient cooling of products of combustion
Waste of small coal
cleaning door
Leaky cleaning doors.

FIG. 4.

This apparatus consists of a fire and one or more ovens by the side of it, as well as often a water boiler and other appliances, which we shall not consider for the present. The products of combustion from the fire are carried in flues across the top of the oven, passing on their way under the hot plate on the top of the range, which is thereby kept hot all over. Afterwards, the gases pass round the sides and back of the oven, across the bottom, and thence into the chimney. The hot plate is used, of course, for the purpose of plate warming and keeping hot dishes of food and other vessels placed on it. Let us consider in detail the losses which are necessarily incurred in an apparatus of this kind.

It has been pointed out that each pound of coal consumed may be taken to represent in all perhaps, from 12 to 14 thousand heat units, according to the quality of the fuel used. It has also been shown that if this fuel is allowed to combine with only the chemically necessary quantity of air, and if the flue gases are thrown away at a temperature of, say, 550 degs., the necessary loss of heat would be, say, 10 per cent. of the whole of the heat in the fuel. This would be a counsel of perfection, and is, in fact, totally unattainable by present methods. If twice the chemically necessary quantity of air is allowed to pass through the fire this loss is doubled. This condition is only attainable by very great care in the design. If eight or ten times the quantity of air, which is far more usual, the loss increases in proportion. It is, therefore, of great importance that the combustion should be conducted under such conditions that as little air passes into the fire as possible, for every additional cubic foot which passes through the fire or into the flue, cools the products of combustion and makes them less capable of heating up the oven plates.

### Chimney Draught.

The draught which keeps the fire going is maintained by passing the waste heat of the hot products into a high chimney. The physical effect is to make the air in the chimney lighter than the surrounding air and so cause all the flues round the oven, which are connected to this chimney, to be under a partial vacuum, or "draught," as it is colloquially termed. If, therefore, there are any leakages whatever, or cracks, leading into the flue or into the fire a great quantity of cold air must be drawn by this chimney draught through the cracks into the flue. This cold air mixes with the hot products of combustion and greatly reduces their temperature, so that they are not effective for keeping the oven plates hot. The cook, therefore, makes good this loss by piling on more fuel.

It is well known that the great majority of kitchen ranges will not heat with coke fuel, although, as will be presently explained, the products of combustion given off from a coke fire ought to have a temperature very much higher than anything needed in the flues round the oven. The reason for this is that the inleakage of air which mixes with these hot products reduces their temperature below the useful point. Instead, therefore, of coke being used, as it should be in all such apparatus, it is necessary to supply a gassy quality of coal which when ignited will burn rapidly and produce a long lambent flame. These flames are carried by the draught into the flues round the oven, and by completing their combustion there (as far as it is completed) make up for the inleakage of air through the cracks.

*(To be continued.)*

* First instalment of the second of a course of lectures delivered at the University College, Gower-street, by Mr. A. H. Barker, B.A., B.Sc., on January 23, and subsequently. Instalments of the first lecture were given in our issues for March 15, 22, 29 and April 5.

## THE CONCRETE INSTITUTE.

### SOME PRACTICAL POINTS IN THE DESIGN AND CONSTRUCTION OF PARTITIONS.

We take the following extracts from a paper by Mr. H. L. Barraclough, read at a meeting of this Institute on March 21 :—

Like many other things, the war has brought partitions into an almost endless number of uses, one of which has been for the building of huts and houses.

When partition slabs were first used they had to meet some stern opposition from those always present in a community who oppose anything new. Even to-day one meets with people who are opposed to innovations. However, we may thank the evils of war for dispelling some objections concerning partitions.

Simple as it may seem, the erection of partition slabs, as experience has proved, should only be entrusted to the hands of men used to this particular class of work. A badly-built up job is sure to develop cracks in unthought-of places, the blame very often being fixed on the manufacturer of the particular partition slabs.

There are several kinds of partition slabs manufactured and on the markets :—Breeze, pumice, plaster and clay, each of which has its special claims.

Plaster, until recently, has been the most common in use, and has many advantages over breeze slabs. Solid plaster slabs are light, easily fixed, with little or no waste in erection. When up, they form a solid wall, hygienic in all ways, as every possible lodgment for dirt and vermin is effectually closed after the walls have been plastered out and are fire and sound-resisting, provided the work has been executed by skilled labour.

My opinion is that hollow plaster slabs, although lighter, have some objectionable features, the compressional strength of the slab having been somewhat destroyed through the apertures ; and further, if spiking is resorted to for fixing, very often the spikes crack the slabs when being driven in, and generally weaken the whole wall.

In fixing plaster partition slabs, it is essential that the suction should be destroyed by applying a thin cement wash, and that they should be well bedded in plaster in preference to spiking.

It is preferable that all slabs, used for partition work, should be tongued and grooved horizontally and vertically, and in fixing, the grooves should be placed upwards and the joints broken, as in brickwork, and the vertical joints carefully grouted in with plaster, both where they join up to the door frames or brick walls, and where they butt against each other.

Plaster slabs have been successfully used for external works fixed on wood framings and faced with tiles, but this is an expensive form of work, and if not carried out by experienced labour, the tiles are liable to come off.

Seven years ago, two-inch plaster slabs were used for internal and external walls of a school in Northumberland. The slabs were fixed to wood framing on outside, rendered over surface with cement, mortar floated to an even surface and rough cast with a mixture of slag and pea gravel, one-inch internal slabs nailed to framing floated and skimmed with washed, haired lime and putty, and finished with putty and plaster throughout, a dado of 3 ft. 6 in. being formed with Portland cement back, and finished with Keene's cement face trowelled smooth. It has proved a very satisfactory construction as well as cheap.

A well-known firm has recently introduced a plaster slab with a special face to receive cement rendering for external work, and they claim that it will withstand the weather for twenty years without being re-rendered. These have been used for external works on several jobs in the Midlands, and would appear to be eminently suitable for a cheap-system cottage or bungalow building. This system could be used in conjunction with light reinforced concrete piers and beams or wood framing, and has the advantage of being a very rapid construction.

The foundation need only be 9 in. depth of good concrete under the wall, weathered on the outside, doing away with the necessity of any damp course.

Breeze partition slabs are manufactured by several firms, in various sizes and shapes. They are light, and one on the market, to my knowledge, affords a first class key for fixing, and is cast with an indentation with horizontal edges. There is always a danger that the breeze used in manufacturing slabs may contain sulphur, which will in time discolour the plaster and cause it to scale off ; and where the partition is faced with tiles, the latter will crack and often fall off, from the action of the sulphur, which seems to go on for a long time, thus causing much annoyance and anxiety.

The pumice slab is a very light form of construction, convenient to handle, and is manufactured from pumice and volcanic sand (imported into this country from Italy) mixed with Portland cement. These slabs form a rigid construction when up.

The hollow terra-cotta partition tile is well known to many, and can be obtained in different sizes from several firms, and has the advantage of being easily handled. It can be obtained with a keyed or smooth face, and is being used just now extensively for exterior work. It is easily built up, the horizontal joints being bedded with cement, and the vertical joints grouted up, and seems to be quite effective in withstanding the weather, but it has only come into prominent use for this purpose recently, owing to the present shortage of other materials, and it remains to be proved what effect time will have on it. I am, however, strongly of the opinion that there are several points in its favour for this purpose: it is cheaper than a brick wall of the same thickness, resists the damp better, and ensures a more even temperature, but does not lend itself to nailing. Where it is necessary to fix skirtings and rails, provision should be made for same at the time of erection by carefully inserting plugs in the joints.

Those of us who have had to do with partitions know only too well that they mostly have the annoying habit of showing cracks, which more often than not go right through. These cracks may develop from either of the following causes :—

The cracks generally occur just under the ceiling or near the walls and door frames, or at the top corners of door frames. The cracks at the tops or by the walls may be caused by variation of temperature, causing expansion or contraction, or through the supports deflecting or settling. Cracks also are generally to be found on top stories of buildings with large flat roofs, owing to the expansion of the flat as well as the partition, and up to the present I have not seen any successful method of stopping this occurring with a built-up partition.

The cracks on doors are particularly noticeable when the jambs project a few inches above the frame, and this is caused by the wood frame swelling, through absorbing the moisture from the partition whilst it is being erected. These can generally be stopped up successfully if cut out and filled in, after the partition has had time to dry out, and will not appear again, provided the door frames are fixed rigidly enough to prevent the partition from being shaken when the door is shut quickly. The best remedy, however, is to prevent this by stopping the door jambs off flush and carrying the partition over in one slab.

The position of a partition is too often left to be settled after the floor and beams are all in, and then it is placed anywhere, whether the weight is supported by a main beam or only by the floor, and more often than not gets placed on the floor, away from the main beam, which may only be calculated to carry a load of 100 lb. per foot super. ; whereas many 3-in. partitions, when plastered both sides, weigh 18 lb. per foot super., and 10 ft. is quite an ordinary height for such a partition ; therefore one foot run would weigh 180 lb. Taking the total weight of the safe at 15 cwts., placed in the centre of the bearing, and the bookcase at 2 cwts. per foot run, we find, if a 3-in. partition, 12 wide by 10 ft. high, happens to be placed on the floor, we get the following load per foot super. in that particular place :—

| | |
|---|---|
| 3 in. partition = 18 lbs. per ft. sup. × 12 ft. wide × 10 ft. high = a distributed load of | 2,160 lbs. |
| 1 safe = a distributed load of 30 cwt. = .. .. .. | 3,360 lbs. |
| 1 tier of shelves, 10 ft. wide, at 2 cwt. per ft. run = 20 cwt. = .. .. .. | 2,240 lbs. |
| Giving a total load of .. | 7,760 lbs. |

Taking the width of floor occupied as 3 ft. × 12 ft. = 36 ft. sup.

Therefore 7,760 lb. ÷ 36 = 215.5 lb. per ft. sup on this particular portion of the floor, which is more than double what the floor weight and main beams were calculated to carry, and except for the large safety factor required by the authorities, there would be more than mere cracks appearing. The writer is strongly of the opinion that the position of all partitions, wherever possible, should be settled at the time of planning, and proper beams arranged to carry them, and when this cannot be done, it is advisable wherever possible to have partitions cast *in situ* and reinforced with small steel rods, forming a beam from wall to wall.

There is yet another means by which a partition can be constructed without slabs, and where a very thin partition is required it has many advantages, as when finished and the whole thoroughly set it forms a very strong and rigid structure, being light, occupying little space and being practically sound-, fire- and vermin-resisting. There is no temporary sheeting or strutting required, and the work can be done with little labour.

The foundation work usually consists of vertical rods, securely and tautly fastened at top and bottom by screws, nails, or clamps at about 12 in. centres. To these supports expanded metal lathing is firmly secured by soft wire or some other convenient means, and both sides covered by any quick and hard-setting plaster, which can be finished to a smooth face without loss of time.

The solid partitions are sometimes built only 1½ in. thick, but generally made to finish 2 in. thick, and can be used in combination with any class of concrete floors and ceilings, or ordinary wooden floors. Doors and other openings that may be required for lifts or ventilation can easily be formed and frames securely fixed in position at the time of construction, or after the partition is up. The whole forms a partition possessing all the desired advantages of a divisional wall not required to carry any weight, and occupies the least possible space for such purposes. This class of partition is very suitable for internal lift wells, where good anchorage can be obtained for the vertical tie rods, as it takes up little room and stands vibration.

### The Teaching of Science.

The committee appointed by the Prime Minister to inquire into the postion of natural science in our educational system, in their report, just issued, recommend that it should be included in the general course of education of all up to the age of sixteen. Science should be an obligatory subject in the entrance examination at Sandhurst, and more encouragement should be given to officers at later stages of their career to improve their scientific qualifications. The Universities should adopt the First School Examination as the normal one for admission, and abolish special matriculation examinations. Greek should not be retained as a necessary subject.

### Book Received.

NOTHING GAINED BY OVERCROWDING ! By Raymond Unwin, F.R.I.B.A. (London : Garden Cities and Town Planning Association. 6d.).

## CORRESPONDENCE.

### Municipal Housing.

SIR,—While it is obvious that, even under present conditions, the provision of housing accommodation will not wait, I entirely agree with your wise insistence upon a proper consideration of future conditions before we commit ourselves to schemes for countless new houses—the economic rent of which, with interest at 5½ per cent., few even of the better-paid workers will be able to afford, and which, even if they could do so, might not prove suited to their altered requirements. Some means of reducing the cubic contents and of cheapening construction must be found—at any rate until labour has shown by its attitude that high wages can justifiably be paid, after which no doubt expansion may be possible in some cases.

As you have pointed out, if bedrooms were to become sleeping apartments only by the elimination of unnecessary washstands, wardrobes, chests, &c.,—these being concentrated in one place—we are reduced to a modified cubicle system with a reduced total area, and it would then be easier to plan such tenements on one floor and to specialise on two and three story buildings, as Professor Adshead has done so successfully at Kennington.

Another development consists in so planning adjoining tenements that certain spaces can be included in either of them according to the size of the tenant's family.

Is there not a case, too, for common kitchens—one for every six or eight tenements with a cook in control who, for a small charge, would prepare the meals and thus free the mothers for other duties?

Also for common crèches or recreation rooms—one for each group—where children could be left during working hours?

It is hardly conceivable that the whole of the women now working will leave their work after the war, and yet their continuance is incompatible with the rearing of families unless some such facilities are devised.

We are on the eve of great changes, and I believe we shall see in our time gas and electric power brought direct from the Kentish mines to London and distributed at such a rate that it can be economically used for cooking, heating and lighting. In that case it would be possible to dispense with fireplaces and their expensive chimney breasts and stacks.

Even under present conditions, however, great economies could be effected by combined central heating whether by gas or electricity or central stoves, and when the cheap power does arrive no structural alterations would be required.

The recent competitions are disappointing in their failure to produce suggestions for new use of materials, nor even under altered by-laws any distinct economies in construction.

The use of reinforced concrete for floors, with linoleum covering, slate hanging for walls, sheet asbestos for inside surfaces, fixed windows without frames, cross ventilation, concrete stairs cast *in situ*, "fabricated" fittings, standard cupboards, &c., sandlime partitions, &c.—such things and their variations should all tend to reduce cost without real sacrifice in efficiency.

Again, why not, before building costly new houses, follow the example of the Kensington Borough Council which proved ten years ago that old houses could be purchased and adapted for tenement purposes at less than half the cost of new ones?

Long rows of houses in such roads as Old Kent-road, Kingsland-road, Walworth-road, Kennington-road have long ceased to serve their original purpose, and could be so treated with advantage to the boroughs and to the local population.

I think it would be a rash proceeding to sanction loans to Local Authorities for new estates on the old lines until experiments have been made in all these directions.

HENRY J. LEANING.

### The Function of Advertising.

SIR,—I can endorse all you say in your recent leader under this heading with regard to advertising, properly employed, being a "scientific means of decreasing the cost of production."

It is easily understood that the more goods a manufacturer sells, the less is the cost of producing the goods.

There are only three ways of selling goods which builders use and which architects specify: Circulars, travellers and advertisements. The first two methods are good, but advertising in the trade papers is the best means of increasing the sales, and of thereby reducing the cost.

Without the aid of the trade papers the selling price of the advertised goods would be materially increased to enable the manufacturer to meet the increased cost of production owing to the reduced sale.

While writing on this subject, I would like to mention another point. Most advertisers, I feel confident, make the same mistake which I made in my first advertising efforts, that is, they do not spend enough when they commence to advertise. They are content to employ small spaces instead of using large spaces.

Almost all advertisers must be prepared to lose a certain amount of money before any medium can possibly pay, and they must also be prepared to give considerable attention and time to the preparation of the advertisements they insert.

Advertising agents know, and the managers of trade papers also know the above facts, but I feel sure the general advertiser in trade papers is not aware of the best method of insuring the success of his advertising.

J. H. KERNER-GREENWOOD.

King's Lynn.

[We believe advertisers would be well advised to pay greater attention to the artistic design of advertisements, so that they would attract greater attention.—ED.]

### The R.I.B.A. Cottage Competition.

SIR,—I have read your leading article of the 5th inst., on the Cottage Competition, with feelings that all is not right. At least, that is how it strikes me as, say, one man in the street.

As far as I can get my thoughts, &c., into words the following are the points:—

After severely snubbing the R.I.B.A. over war work, the Government as a sop gives the R.I.B.A. a competition to assess, and the Institute issued particulars, &c., and asked all architects who could to compete, to give a full show of interest in the work.

Well, I cannot call to mind any *clarion note* of protest on the part of the *Builder* calling on architects not to compete because the war was on, &c., or finding fault with the Institute's requirements as being based on usual types, or that it was most necessary to evolve some wonderful scheme that had never been dreamt of before.

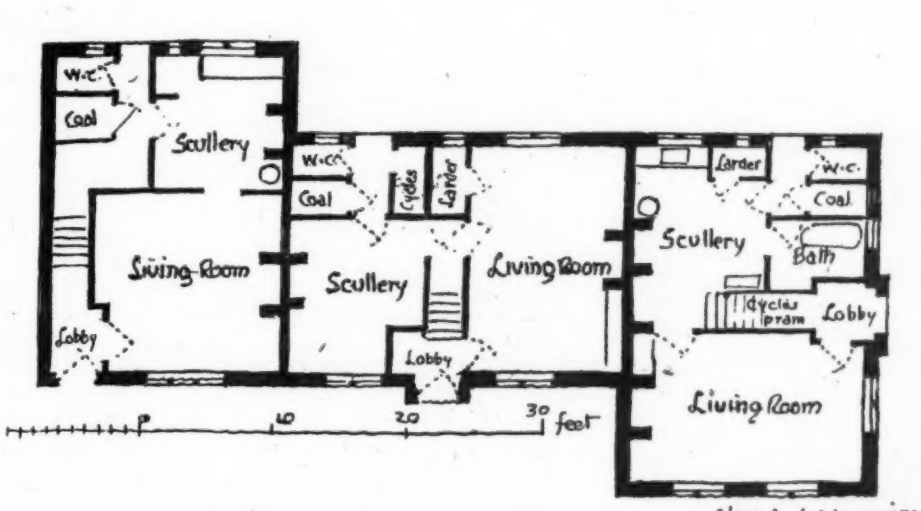
Therefore it seems distinctly unkind to the Institute to quietly and severely blame it now!

To sit on the fence should not be the policy of the *Builder*, but a policy of "leading" quite as much as or more than the poor, badly treated and badly remunerated architect, who looks to the *Builder*, &c., for gleams of starlight—his own particular wagon-hitched star not being of, say, the first magnitude.

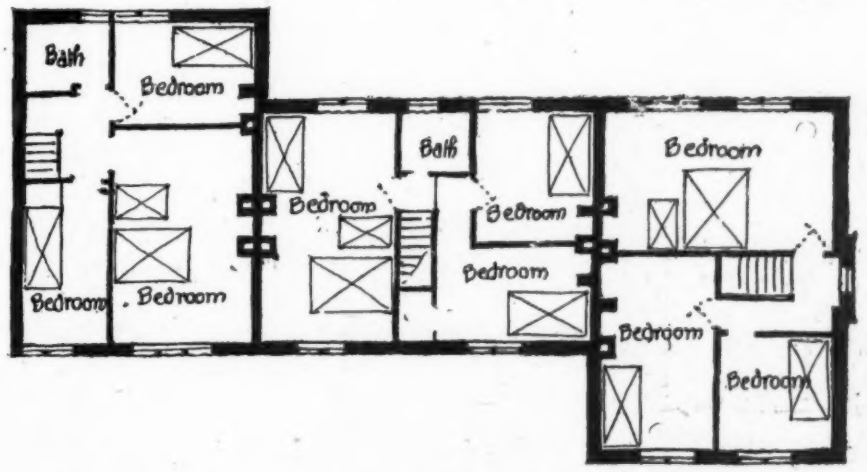
UNITED STATES.

[We are not aware that we have ever blamed architects for taking part in the Competition in question, because the war "was on," and we were never consulted by the promoters of the Competition with regard to the conditions issued. Neither were we aware that we were sitting on any "fence," and our correspondent apparently blames us because we have given architects a lead, possibly, in a direction in which some of them do not wish to follow.—ED.]

[See also pages 241 & 243 for other letters. —ED.]




Class A 1st premium




**L.G.B. & R.I.B.A. Cottage Competition (Home Counties.)** *See next page.*

Class A. 1st Premiated Design, by Mr. C. M. CRICKMER.

## Leading Contents.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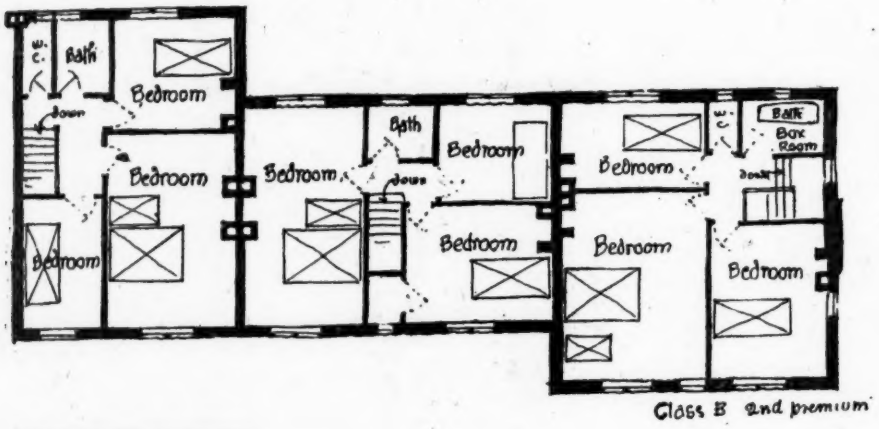
## ILLUSTRATIONS.

### The R.I.B.A. Cottage Competition.

WE have not the pleasure yet of reproducing the drawings sent in for the L.G.B. cottage competition, but we give sketch plans and views of some of the prominent designs which will enable our readers who have not seen the collected drawings to form some idea of the artistic and practical results. They will probably agree with us that some of the work we illustrate merited rewards, though not securing them. We think it ought to be realised that in the matter of architectural design some excellent work has been called forth, and to such an extent as to deserve recognition.

The designs by Mr. C. M. Crickmer, which secure two first premiums and one second, are so similarly treated in elevation that one exterior view seemed sufficient to indicate the character of them all. We ought to point out that one error has crept into the view of Mr. C. Wontner Smith's second premiated design, where the central chimney stack should have been shown of the same height as those towards the end of the group. In Mr. Cox's design the brick jointings and the wall faces have been omitted so as to give greater emphasis to the solids and voids.




**L.G.B. & R.I.B.A. Cottage Competition (Home Counties).**
Class B. 2nd Premiated Design, by Mr. C. M. CRICKMER.

# GENERAL NEWS.

### Building Materials Inquiry.

The Committee set up by the Minister of Reconstruction to ascertain what steps may be taken to ensure adequate supplies of all kinds of building materials during the transition period immediately following the cessation of hostilities are instituting a general inquiry as to the probable consumption of materials during that period. In co-operation with the R.I.B.A., the National Federation of Building Trade Employers and other Federations and Associations interested, the Committee have drawn up Forms of Return with regard to :

(1) New building works to be begun after the stoppage of hostilities.

(2) Works, the erection of which was begun but was stopped by the direction of the Ministry of Munitions.

(3) Building works proposed to be undertaken for public local authorities.

These Forms of Return are being sent to architects and builders and to local authorities throughout the country, and the Committee hope that, in the interests both of the nation and of the individual, they will be filled in and returned, thus assisting materially the work of the Committee. Any inquiries on the subject should be addressed to The Secretary, Building Materials Supply Committee, 6A, Dean's-yard, Westminster, S.W.

### Development Plan of Greater London.

We take the following remarks from the sixth annual report, 1917–18, of the London Society :—

" The Plan is completed, but owing to the serious depletion of their staff, Messrs. Stanford have not yet been able to entirely finish the reproduction of the whole of the plan. Those sheets which they have already submitted to us in proof, however, more than reach the level of our hopes as to the finished result of the work, and we feel sure that when the map is published our members will think the same. It is easy to realise that a monumental plan of this description, on which nine draughtsmen and a committee of equal strength have been engaged, could not but show some divergency of execution, but Mr. Ernest Herbert, who was the last architect to work upon the plan, has rendered the Society invaluable service by thoroughly harmonising the whole. . . . The usefulness of the plan has been abundantly proved during its various stages and since its completion. Representatives from local authorities, who have consulted it, have expressed themselves as much helped by seeing, grouped together on one sheet, all the proposals of adjoining councils before themselves embarking upon further town planning or housing schemes of importance. To show a complete scheme for the future development of the vast area of Greater London—a task never before attempted—was, indeed, our great aim in formulating the Development Plan. The scheme has been carried out without any strain on the resources of the Society, thanks to the generous contributions in time and money that have been so freely given. "

### The Heart of London Plan.

The Council of the London Society, in their sixth annual report, state that for some time past they have felt that a fitting complement to the Development Plan—which was worked out on the 6 in. Ordnance sheets and reproduced to 3 in. scale—would be a map for improvements in the heart of London. " This naturally must be evolved on a larger scale—probably the 25 in. The committee which has undertaken this scheme—less in area but greater in difficulty than the Development Plan—is as follows :—Sir Aston Webb (Chairman), Professor Adshead, Mr. Arthur Crow, Mr. W. R. Davidge, Mr. E. T. Hall, Mr. H. J. Leaning, Mr. D. Barclay Niven, Mr. Paul Waterhouse. After a few preliminary meetings they discovered that the railways of London dominated all suggestions, and a Railway Sub-Committee was appointed (Professor Adshead, Mr. Davidge and Mr., Leaning) to produce a practical scheme. After some deliberations they recommended the Council to engage the services of Mr. W. Tetley Stephenson, Lecturer on Transport at the London School of Economics, and one of the staff consulted by Sir Herbert Jekyll in 1905, when he attempted to do the identical work upon which our Committee is now engaged. At that time, however, from various causes, no progress was made. Since the war there has been a change and it is hoped such schemes may now be discussed in a way that before was not possible. When, with Mr. Stephenson's help, our scheme of transport is complete, the Heart of London Plan should go forward rapidly and will, we believe, add greatly to the value of the work which has already been done by the Society during the war."

## MEETINGS.

TUESDAY, *April* 23.

*The London Society (at the Royal Society of Arts).*—Rev. W. H. Carnegie, M.A., on " St. Margaret's Church, Westminster." 5 p.m.

*Institution of Civil Engineers.*—Annual general meeting. 5.30 p.m. To be followed by a meeting for the purpose of dealing with an amendment of the By-laws.

WEDNESDAY, *April* 24.

*Royal Sanitary Institute.*—Mr. Frank Baines, M.V.O., F.R.I.B.A., on " Housing : Planning and Materials, Permanent and Semi-permanent " ; and Mrs. Sanderson Furness on " Housing : Fitments and Conveniences." 5 p.m.

THURSDAY, *April* 25.

*Concrete Institute.*—Mr. J. H. Deane, M.Inst.C.E., on " The Charterhouse-street Cold Stores of the Port of London Authority." 5.30 p.m.

# THE SURVEYORS' INSTITUTION.

## "THE COST OF BUILDING BEFORE AND AFTER THE WAR."

THE following is the second half of the paper read by Mr. E. H. Selby on Monday last week at a meeting of the Surveyors' Institution. The first part was given in our last issue, page 225 :—

The advent of the sub-contractor and specialist has, in one sense, made the task of the estimator easier, and in another more difficult, as, if a reasonable amount is put down for the use of scaffolding, plant and appliances to be found by the contractor for the general conduct of the job, and for profit, he usually finds out that someone else is willing to cut these things a bit finer.

Latterly a good many tenders have contained work of two classes, that to be tendered for by the contractor, and that for which provisional sums are included to be paid out to sub-contractors and specialists, and as the total amounts for each class were sometimes about equal, the profit and attendances added to those provisional sums had a considerable influence on the amount of the tender.

The practice of the sub-letting of certain trades or portions of trades to other contractors is of great assistance to the estimator, but I think that, before taking their estimates as his own, he should carefully examine the prices, as well as exercise discretion in the choice of the estimates adopted.

The time and money spent in obtaining these sub-estimates and quotations is prodigious, but I cannot see, under the complicated system of keen competition, that there is any other method of obtaining reliable information when one has to tender for work all over the country.

Having set forth the difficulties to be overcome, and the information to be obtained, we now come to the conditions prevailing under which work had, or will have, to be undertaken. Considering, in the first place, *the prices of work obtaining before the war*, I think it must be generally admitted that competition was keen, and that the number of jobs placed in contractors' hands without competition were few and far between. The natural reaction following the boom in the building trades some fifteen years ago was felt acutely just before the war, and prices were cut very fairly owing to the supply being greater than the demand.

The accumulation of wealth necessitated finding some means for employment, and people not infrequently embarked upon schemes and businesses about which their knowledge and experience was limited, and they, therefore, had to rely almost entirely upon the advice given them by others without being able to verify it themselves or to assist in arriving at any general conclusions. Unless an estimator with a long and varied experience in pricing was employed, not perhaps having the necessary data upon which to base his prices in the office, the results were somewhat erratic, and work was not infrequently undertaken at cost, or even under, the competition among the specialists and sub-contractors being especially keen.

Of late years, a great deal of time and attention has been paid to teaching the elementary and advanced stages of building construction, but I personally have not come across many, or any, young people who have been taught much of the science of estimating. A number of books have been published giving the prices of various work, but when all is said, the numerous prices it is possible to give are merely examples, and the data given have to be applied to the actual work tendered for.

After gaining all the information obtainable from all sources, the next thing to do is to be able to price an estimate on the information thus obtained. This, however, is only the beginning, for many estimates are priced, and but few contracts obtained. It is not sufficient for an estimator to be able to price a bill on hard-and-fast lines. He must keep in constant touch with the prices that are being quoted, and attempt to ascertain where and why other estimates differ from his own. Of course, there is a point reached at which jobs are not worth taking ; but as the class of work asked for is constantly varying, and as the extreme cutters cannot manage to carry off all the cream of the work, some crumbs must fall at last to the fairly-priced estimate. As time goes on, even the most extreme of the cutters have to revise their prices, as contractors, and even limited liability companies have a limit to their resources, and I suppose that even advertisement has its price.

Of course, when any contracting firm is well established and is noted for good work, the competition for high-class work is not quite so keen, as such firms tendering usually know what the work is really worth, and price accordingly. The practice of pricing out items to the 1-16th of a penny really does not make any appreciable difference in the amount of the tender, and is very likely to lead to mistakes being made in the subsequent clerical work, especially when tenders have to be submitted at short notice. If the prices are arrived at on sound and consistent principles, a far more accurate estimate can be arrived at in the time given, without going into such intricacies.

The cost of building was, like everything else, high, owing mainly to the largely increased commodities required in each building, and to the more permanent and lasting and, in some cases, extravagant means that had to be adopted to meet the competition in the buildings erected ; the latest up-to-date building erected being eclipsed by more up-to-date and elaborate buildings in a few years.

Both labour and materials had been rising for a number of years although the saving effected in the form of construction of the work might possibly partly cover the additional cost, notwithstanding the cost of labour had not only risen considerably but the output had also been reduced. These matters, however, usually right themselves in time, as it is not to be supposed that buildings were erected unless there was some chance of their being a commercial success. Although the cost of building had increased, the rents for commercial buildings had increased in a greater proportion, the more up-to-date buildings commanding far higher rents than the older ones.

The next phase I now come to is *the prices of work during the war*. When this stupendous conflict was first thrust upon us, the position was not apparently at first properly appreciated. "Business as usual" was attempted, presuming that we could carry on the war with one hand and conduct our business with the other.

This extraordinary state of things continued for about fifteen months, and the prices of materials during that time, with the exception of those used for the actual carrying on of the war, did not advance to any appreciable extent, and the cost of the labour for the time remained about the same. Soon, however, the enormous inroads made into the stocks of timber in the country, used in the construction of huts for the troops and other military purposes, came to be felt, and the cost of all materials that we had previously obtained from abroad advanced rapidly, owing to shortage and increased shipping freights.

The cost of living advanced by leaps and bounds, and, of course, the rate of wages paid to workmen had to be correspondingly increased and war bonuses granted. When all private work had eventually to be stopped, to allow the Government to carry out those enormous works which were necessary to produce the sinews of war, the prices of materials continuously advanced, and the output of labour, at least in the building trades, in a large number of cases steadily decreased. The practice of placing contracts on a percentage of profit basis did not tend to improve matters, and to meet the exigencies of the situation, most of the work *having* to be done in a very short time, a greater quantity of labour was employed than could be used advantageously.

The condition of things soon became chaotic, quotations were given under all sorts of restrictions, and were subject to alteration without notice. Stocks were commandeered, and prices of all materials rose considerably and are still rising. In spite of the tremendous increase in price many and heavy losses were incurred on lump sum contracts, and a very large amount of the work now being carried out is on a cost and profit basis, or, if on a lump sum, with contingent increases for rises in prices of labour and materials.

What will eventually be done with pre-war contracts that extended into the war period and the contracts taken during the war period still remains to be seen, but the application of the principles underlying the Courts (Emergency Powers) Act of 1917 may, in some measure, assist in distributing the loss among the parties concerned.

I shall not attempt to deal with the prices during the war in detail, as no useful purpose would be achieved by doing so. We hope and trust they are transitory, and will soon be buried in oblivion. It must not be overlooked, however, that the prices of materials home produced and the few that are imported are still going steadily up, and it is impossible to say how high prices will eventually reach, while advances are continually being made in the rates of wages.

I now come to the last phase, *of the presumptive or speculative prices for work that will probably rule after the war is over*, which, of course, will be affected to a very large extent by the conditions under which peace is made.

Taking first the cost of labour, this must be governed by the cost of living, and although house rents have not advanced as yet to any appreciable extent, the cost of living, which seriously affects the pockets of wage-earners, will not, in my opinion, be reduced for some years to come, and I submit that only by the reduction in the cost of living can the wages of workmen be reasonably expected to be reduced.

If it is found possible to specialise in the various trades, so that each man can take up a particular job, or portion of a job, greater efficiency, and consequently greater output, would be the result, and if each task could be arranged so that the workman or workmen employed could be paid by result on a uniform basis, more economical means might be found of executing the work.

The process of rate cutting by reducing the scale of payment would, of course, tend to slow down the output, but if proper rates, in the first place, are arranged on an equitable basis by the employers, in conjunction with the workmen, and workmen choose to exert themselves, the result ought to be satisfactory, the employers benefiting by the increased output, and the competent workmen would be enabled to earn far more with the general public benefiting to the largest extent.

There were certain specialised trades before the war, such as slating and tiling, wood block floor, mosaic and other special floor coverings, gauged brick-cutting, fencing, certain forms of metal working, glazing, and many others, where men were employed always at the same thing, and thus became far more expert, where the prices at which these particular works were executed could not be done by ordinary tradesmen. Surely if the work is done, and done properly, and a proper living wage is to be earned, the cheaper the work is done the better for all.

If some sort of a scale of wages were arranged for output, which was not immediately varied directly the employers considered the workmen were earning too much, or varied to suit the requirements of those people whose one idea appears to be to do as little as possible, not only would the cost be in time reduced, but estimates could be much more closely and accurately priced.

As occasion arose, the rates could be revised to suit the particular localities by mutual agreement, and I feel convinced that, in this way, the cost of many materials could be reduced, and a great many savings be effected in the course of working and fixing the materials at the site.

Considering the extensive schemes that are being launched for industrial housing and the

cost of same, unless the State is going to bear a serious loss, the rents of these new houses will have to be considerably higher than the rents paid for similar houses before the war, and this again will tend to raise wages, or at any rate keep them at a high level. However, taking all these things into consideration, the increased output which ought to result from better wages, shorter hours, and better conditions of living may, when the excitement of unrest caused by the war has calmed down, result in the lowering of the cost of work considerably. Whether this happy result will follow or not has to be proved, but the enormous convulsion caused by this war may have startling results, especially when the boys of all sorts and conditions who have been so gallantly fighting and unselfishly giving their lives for their king and country return to us again. These great social questions do not come within the scope of this paper, but they are bound to have a far-reaching effect on the prices at which buildings will be erected after the war.

The price of labour will naturally largely affect the cost of materials, and if the labour problem in the production of materials can be entirely solved by payment by results, the cost of materials ought to come down in a reasonable time to something approximating to pre-war rates.

The governing factor in all things, however, has been, and always will be, supply and demand, and considering the enormous arrears of work that will have to be taken in hand when the war is over, it is not to be supposed that prices will come down when there is so much work about.

The amount of war work now being carried out by the Government, except no doubt the new shipyards extensions, we hope will be promptly closed down, and resumed, if found necessary, at some future and more auspicious occasion, thus releasing a large number of men, who, as they are discharged, can be taken on for the more urgent semi-public work, such as repairs to railways, roads, &c., housing, and the re-instatement of buildings temporarily occupied by the military and the Government departments.

When tenders are again submitted, for some time at least, estimating will be more or less of a gamble, until some new and reliable data can be obtained upon which to base the cost of work, and it is not to be supposed that contractors will take all risks unless they are properly covered by prices or insurances. The same difficulties in pricing that existed before the war will still exist after the war, with the additional difficulties of finance, which will most probably tend to keep prices up.

The cost of materials in this country, with the exception of essentially war materials, ought to come down to some extent quickly, but with regard to the cost of materials that have to be imported from abroad, the matter is far more complicated. Freightage will continue to be high for some time, but the rate of shipping insurance will be largely reduced directly the war is over, a fact which must at once exercise a considerable effect on the price of imported materials.

The first duty of shipping must, of course, be the supply of foodstuffs, and, considering the position of this country with regard to the home supply of food, a very considerable amount of shipping will be necessary to replenish our depleted larders. There is also the very large amount of shipping that will be required for the transport of men and materials from the war areas, not only to this country but also to America and the Colonies.

To obtain and import timber will be one of the chief difficulties, as the various sources of supply have been largely depleted and dislocated, and will take some time to get into working order again, and although it has been found possible largely to do away with the use of timber in construction, yet a certain amount must of necessity be used in every building. The question of being able to obtain timber in any quantity after the war will largely depend upon the length of time the war lasts.

A large amount of home-grown timber has been made use of lately in our war buildings for carcasing work, but usually it has been quite unseasoned, and although the scantlings have been cut down to the smallest sizes, it remains to be seen whether it will prove efficient or not.

Setting aside the amount of work to be done in this country, where the damage thus far caused has not been very extensive, there is the very serious problem of re-building those regions that have been utterly devastated on the fields of battle, and surely this work ought to take preference over everything else, considering that up to the present those regions unfortunately lie mostly within the borders of our Allies or quondam Allies.

After the calls of nature with regard to food have been met, the housing of the population of the devastated regions must be attended to, and although the numerous temporary buildings erected all over the battle area will be of inestimable value in housing the workmen engaged upon the work of reconstruction, they are hardly suitable for domestic purposes, and, in any event, the majority are of quite a temporary character and would be very costly to maintain, even if that were possible for more than a few years.

The task of reinstating these devastated areas can be effected either by the inhabitants or by the inhabitants with the willing assistance of their Allies, or by the forced assistance of their enemies, or possibly by the united efforts of all parties. I do not think that the fact should be overlooked that in all probability we shall be called upon to supply labour and materials for housing the people, and at least a portion of the materials for the reinstatement of the factories and business premises in those areas.

A large proportion of the buildings constructed during the war (excepting those erected for the manufacture of arms and munitions, and even in some of those, where time was essential, strange and unusual methods and materials have been adopted) are of a more or less temporary character, and will not be of any permanent use. The numerous factories and additions to existing factories and buildings of that description (erected of a more substantial kind) ought to be capable of being adapted for the production of peace commodities, so that in some measure the call for that particular class of building, which we hope would be in great demand, ought not to be so pressing, unless (after our late experience) we proceed to at once prepare for the next great war.

For the first nine to twelve months after the war the question of labour will still be acute until a large number of soldiers have returned and settled down to civil life, and during that time building operations will be as difficult, or almost as difficult, as during the war, so that during that period the cost of building will, in my opinion, remain at about the level of that at the end of the war, even supposing that the Government do not place an embargo on all luxury buildings for some time, in order to push forward their numerous housing and other schemes, which, I think, is more than probable. After then, however, when things have more or less resumed their natural courses, the cost of building should be reduced.

The cost of materials produced in this country has not advanced in the same proportion as the cost of materials we have had to import, so that when ordinary buildings are again erected in a reasonable time, the cost of same ought, and to a considerable extent, to quickly come down from "the during the war prices."

Coming now to the principal question of what the prices after the war are likely to be, if we take the pre-war rate of building at $x$, the consequent increased rate after the war will naturally be $y$. Much has been said, and many conjectures made as to what $y$ will be; one thing, I think, is generally admitted, that $y$ will be a plus and not a minus quantity.

Wages, taking into account war bonuses, have already risen about 50 per cent., and materials anything from 50 to 500 per cent. It must not be overlooked, however, that the great bulk of the work has been carried on all over the country, and at great stress. Places have been selected for building operations in most inaccessible spots and the difficulties in housing the workmen were frequently solved by building temporary hutting accommodation, or bringing men in from the surrounding districts by train or other means of quick transit, and railway communications had to be formed. These obstacles have naturally raised the cost of the work, as all the workmen's special expenses had to be paid, and an allowance made for the extra expenses they were put to in living away from home.

These conditions, however, should rapidly alter when we return to more normal times, and although the rate of wages (exclusive of the purely war bonuses) will take some time to be reduced—if it is ever reduced—yet the total cost of the work may not be very greatly increased thereby if a little more latitude is allowed in the construction of buildings and some system of co-operation adopted between masters and men before referred to.

Passing over the period of the first nine to twelve months after the war, by which time we may expect to have returned to something like normal times, we shall also return, we hope, to ordinary building conditions.

Separating the constructional work and the finishings of a building, which in ordinary buildings, excluding factories, can be taken at roughly about half-and-half, the constructional work is largely made up of materials, while the finishings take a greater percentage of labour.

Taking the constructional part first: the cost of materials manufactured in this country will, in my opinion, soon return to about the pre-war cost, that is to say, within about 15 per cent., with the exception of constructional steelwork, of which very large quantities will be required for shipbuilding: ferro-concrete ships will have to be proved, and I understand there are many serious objections to their use. However, the enormous increase of plant for producing steel all over the world may very shortly reduce the price considerably. If different methods are adopted of dealing with labour on the job, here again, I think, the cost of output will not be more than 20 per cent. to 25 per cent. additional, so that the cost of the constructional work ought not to exceed 18 per cent. over pre-war prices.

The finishings, however, stand on a different footing, especially with regard to timber. The cost of finishings will, in my opinion, be increased at least 35 per cent., so that, taking ordinary buildings, the extra cost will be about 27 per cent., and factories and buildings, when the finishings are of small moment, about 22 per cent. above pre-war prices.

In arriving at these figures, I am, of course, assuming that normal conditions obtain, and that the Army and Navy have been reduced to reasonable proportions, and that the work of re-housing in the war-devastated areas has been well started, so that the people of those areas are able to grapple with the remaining problems themselves. How long this will take, and how much assistance we shall be called upon to render, entirely depends upon how much longer the war lasts, and how much more damage is caused, and what further districts become involved.

Taking a reasonable view, as far as any view can be called reasonable, twelve to eighteen months ought to be sufficient in which to render the necessary assistance to our Allies before we can turn our attention entirely to our own wants, although after about nine to twelve months, as already stated, a large number of men ought to be available for building work at home.

The question of the price of all materials will largely depend upon the amount of materials we shall be called upon to supply to other countries, as during the time the competition between the home and foreign markets exists there will not be very much likelihood of prices returning to the normal, nor is it at all probable that we shall be able to obtain many building materials from abroad for some time.

The arrears of building operations and repairs in this country will be so large that for at least another ten years after we have returned to normal conditions there will be no prospect of reduction in cost through supply exceeding demand.

Housing schemes for the working classes, and above all convalescent and permanent homes for wounded and disabled soldiers and sailors, will have to be taken in hand at once, and ought to provide plenty of work for those now engaged on solely war buildings, as and when they are discharged, so that the men are not out of employment whether the war is finished or not.

The control by Government of certain industries and trades after this period ought to be ended, as by that time they ought not to be the largest buyers in the market.

I have not considered the question of strikes in the building trades, as I hope after all we have been through some better method will be found of solving labour problems than the suicidal methods adopted during the last fifty or sixty years, whereby a large portion of trade has been lost to this country.

Before concluding this paper, I think one matter ought to be considered, and that is the placing of contracts after the war. For the first few years great difficulties will be experienced in estimating, owing to the unknown cost of labour and the varying prices of materials, and the fairest and most economical method will be for work to be placed at cost with a fixed profit and the necessary precautions taken to check same so as to arrange for finance. In this way it will be possible to compile prices that will meet the new conditions, and so enable contractors to submit close and firm estimates.

As soon as building operations can be accurately tendered for and placed in the hands of contractors so soon will the cost of buildings be brought down, as from their experience they should be able to carry out the work in the most expeditious and economical manner. The incentive of turnover and profit will always bring out the greatest energy and initiative of the individual, and if this great war produces a better and more human element between employers and employees, resulting in unremitting application, hard work, and enterprise all round, enabling us to hold our own and resume our old position of supremacy during the difficult period of reconstruction after the war, it will not have been fought in vain.

Mr. Corderoy said the author described an estimate as some approximation to the truth, and then went on to refer to pricing as a science. It was true that, in a way, pricing might be described as a science, but it could never be what was popularly called an exact science. It must always be dependent on the application of experience and judgment, and the envisioning by the trained imagination of the circumstances surrounding the execution of the project which was the subject of the estimate. Reference was made to another important matter, which was that of waste, and the illustration given was not one of waste but shrinkage due to the manufacture of the component building materials upon the work. Avoidable waste was due to the careless ordering, handling, and storage of materials, and waste of labour was due to faulty organisation and to the setting of impossible and therefore disheartening tasks. This was a fruitful source of waste in the execution of works, and a big contractor of his acquaintance once told him that the one object of his life was the checking and prevention of waste. The assumption upon which a good estimator was entitled to proceed was that good work would be carried out, and that waste would be prevented. He was inclined to think that failures in connection with works were more largely due to waste than was generally realised by those seeking to know the causes. With regard to the methods of carrying out work, he thought when the conditions of execution were precisely known the lump sum contract was the best form of contract for all parties. If, however, there was much underground work to be done he would consider that it was best to work on a schedule. In prime cost work there was no incentive for those concerned to practise economy, and the building owner was entirely dependent on the personal idiosyncracies of the contractor or the man in charge. In his judgment, the ideal arrangement with regard to any important work was for the architect to concern himself with the preparation of the design and the supervision of the finished work. The surveyor should prepare documents for the purpose of obtaining tenders, and the contractor should be left a free hand as to the best methods of carrying the work out. He agreed that it was very little use discussing the prices which had prevailed during the war period, because it was fervently to be hoped that business would not be continued under the chaotic conditions which now existed, the bulk of which were due to the artificial way in which they were living, but some of which were directly traceable to the inexperience of those dealing with large matters of business, and the failure to employ professional experts who had made this business the study of their lives. During 1913–14, prices were abnormally high, owing to the fear of labour disturbances and the great cost of materials, but many good judges thought that had not the war intervened there would have been some modification in prices all round. In trying to institute a comparison between pre-war conditions and the likely post-war conditions the author had taken a period twelve months after the close of the war. He was inclined to endorse the conclusions arrived at by Mr. Selby, except that he would fix the comparative increase somewhat higher. He was aware that there was a great difference of opinion amongst persons of recognised authority on that point, but some of the difference arose owing to the same comparative periods not being taken. A most important factor in the making of any of these conclusions was the estimation of the amount of time which would elapse before they returned to settled conditions, and on the whole he was inclined to think that the estimates of a long period were not altogether warranted by the probability. There could be no doubt that the war had greatly quickened the productive capacity of the country, and there was also to be reckoned the stimulus which would be given to the invention of labour-saving machinery. He endorsed the author's opinion that a good deal might be done in the way of the simplification of scaffolding. He was one who hoped the workman would abandon his pernicious views as to the limitation of output, but equally the employer would have to abandon the practice of cutting rates. He did not think they had anything to fear from the bugbear of over-production, for there was an enormous demand for buildings which could only be met by cheapening construction, and as soon as it was brought down to a reasonable level the demand would grow.

Mr. F. H. A. Hardcastle expressed regret that young men had so few opportunities of learning anything about prices. He also considered that the short time allowed for the preparation of estimates amounted almost to a scandal, for it led to a lot of wide and incorrect tendering, which resulted very often in subsequent trouble. If, as surveyors, they could convince the building owner that this was prejudicial to his interests, as well as injurious to the builder, they would have done rather a good thing. He agreed with the last speaker that if the standard of living amongst the workers was to be raised, production must considerably increase. He was reading about the employment of machinery in the United States, and found that, taking all trades, the machinery used was vastly in excess of that used in this country. It was evident that they must increase the use of machinery if they were to hold their own in the future. He did not take so sanguine a view as Mr. Selby as to the cost of building after the war, as he fancied there would be great difficulty in lowering wages, and also tremendous competition for materials. At the same time he sincerely hoped he was wrong in that view.

Mr. Alan Paull thought the paper should have had the title extended, as it dealt largely with the science of estimation with regard to the cost of building after the war. Little was said on the subject of finance, and this was a matter which was bound to have a great bearing on the question. They had come to a time when the Government had to pay at least 5 per cent. for money, which meant that the ordinary financier would require a bigger rate of interest for money to finance building schemes. But the great point was the wages which the workmen would require. At present they were simply living in a vicious circle, and if only that could be stopped a great deal would have been done in the way of cheapening production. He agreed with Mr. Selby as to the probable cost of building after the war, but he thought it would be from eighteen months to two years after the termination of hostilities before they settled down to the ordinary routine of building work.

Mr. Baylis pointed out that at one period of the war the cost of timber was increased by something like £5 per standard, owing solely to the difference in the rate of exchange between this country and Norway. That was a factor in the problem. He did not think machinery could be largely used in the building trade, as in building there was not the repetitions as in other trades. Reference had been made to men specialising in particular operations, but if they did that too much in the building trade they might soon get to a point where any saving would be more than counterbalanced by waste of time in men going from one part of the building to another. Under the new conditions of contract in Scotland here was a chance which provided for account to be taken of the rise and fall in the cost of materials in the case of variation of the contract. The condition was enforced by the contractors, owing to the rise of materials in 1913–14, but whether they would like that when the clause worked against them was another matter. He was inclined to think that competition would not be so keen after the war, owing to the fact that many of the smaller builders had been crushed out of business.

Replying on the discussion, Mr. Selby remarked that the basic prices which ruled in the building trade prior to the war had all been swept away, and in making estimates for the future they would have to start *de novo*, not only with regard to materials, but also as to wages. He was convinced that if wages continued to increase and output was decreased, a great deal of ingenuity would be directed towards discovering methods of carrying out work by machinery, as was done now in America. The British workman would find that he had made a very great mistake indeed, and that he was not indispensable, as his work might be done by machinery to a great extent.

## THE SALE AND PURCHASE OF BUILDING BRICKS.

The following correspondence has been sent to us for publication :—

SIR,—With reference to an announcement of the Minister of Munitions restricting the sale or purchase of building bricks I, on the 6th instant, wrote to the newly-appointed Controller as follows :—

" SIR,—Regarding the announcement in the *Times* yesterday that you have been appointed Controller of Bricks, I should be glad if you could give me an appointment, as I am in a position to supply, with existing plant now lying idle, from 6,000 to 10,000 per day. I have facilities for considerable increase.—Yours truly,

" A. E. TIMBRELL."

In reply I received a letter as follows :—

" Ministry of Munitions of War,
" Whitehall Place,
" London, S.W. 1.
" April 9, 1918.

" Mr. A. E. Timbrell,
" 16, Regent-street, S.W. 1.

" SIR,—In reply to yours of the 6th instant, if you care to send me full particulars of the brick works you refer to I shall be pleased to file it with several hundred other brick works which are in the same position as the one you refer to.—Your obedient servant,

" H. CARTER PEGG,
" *Controller of Building Bricks.*"

Is it to be understood that there is no shortage of building bricks ?

J. E. TIMBRELL.

# THE BUILDING TRADE.

## PLUMBERS' REGISTRATION AND APPRENTICESHIP.

WISE reconstruction after the war is now admitted among thinking men to contain the root of the country's future successful development. Many weak and false tenets of a past peace time will have to be scrapped and new issues faced with new eyes and fresh courage. Wise are they who are working at perfecting their schemes so as to be ready for the demands of that new world which the advent of the hoped-for Peace will, when it comes, open out for us.

Of the many allied trades upon which the art of building and the welfare of the community depend, the plumbers' trade may be said to be peculiarly an indispensable one. We can so adapt our materials as to do without the mason or the bricklayer, or even, in finalities, the carpenter. No other craftsman can fitly take the place or share his responsibility with the plumber. If the fitter tries his hand at plumbing we know by experience what generally happens. Among the building trades also plumbing shares with the recently-developed electrical craft the distinction of being perhaps most dependent upon science and scientific accomplishment. It is just for this reason, and because of its inherent importance and indispensability, that the efficiency of the plumber is a matter of real moment to the community, while deficiency in plumbing is apt to cause the acme of annoyance and distress, and, by tempting the argument from the particular to the general, to bring the craft as a whole into undeserved contempt. Who shall say that that contempt—which has become almost a by-word as regards the conventional plumber in the eyes of the man in the street—has not been in the past in some measure deserved? Standards of scientific efficiency in plumbing have, it is true, been set up. Who of the ordinary public, dependent for his health though he be upon the plumber, knows anything about such standards, or troubles himself as to where they are to be sought or found? Is he not too often content to call in the local jobber and accept just what he is given?—cheap labour, which has acquired enough trade tricks to pass muster in a world of average incompetence. Yet all the time Great Britain has set the hall mark of efficiency upon the plumber's craft. There are to be found within her borders to-day plumbers, and plenty of them, who, despite Victorian slackness in scientific educative methods or apprenticeship systems, have mastered their difficult trade in all its complexities, and have created standards which Continental nations have been fain—though even so at some distance—to follow. It is certainly the fault of the British public, and undoubtedly a lapse upon the part of the architectural profession, if plumbers of this quality, who will generally be found to be Registered Plumbers, are not exclusively employed, not only upon works of importance, but upon all works great and small (for small works equally with great claim efficiency) to the exclusion of the indifferent labour so frequently foisted upon the community, particularly in the cheaper urban and suburban districts where low-rented houses abound.

We have before us, as an instance of reconstruction on sound lines, what strikes us as an effective Scheme of Apprenticeship, set up by the plumbers of the London area. It appeals to us as a model of what such schemes should be, and we accept it as an indication that the London plumbing trade is alive to its best interest—efficiency—which is also the interest of the community. The scheme sets up an Apprenticeship Council, to which, by a legal indenture, definite administrative powers are accorded by masters, fathers (or guardians) and apprentices. Its essence is to combine training at the Technical Schools with workshop practice, and its novelty is the requirement that the apprentice, after reaching the now leaving-school age of fourteen, must pass the next two years wholly at a technical school of plumbing; being apprenticed during that period directly to the Apprenticeship Council. They in their turn introduce a selected master when the lad joins the workshop and begins to earn wages for himself. It would take too long to describe the scheme in detail. Suffice it to say that all difficulties appear to have been thought out and mastered. We notice with satisfaction that the various stages of the apprentice's progress are punctuated with practical examinations in his craft, and in return for his assiduity he is able to earn during the last four years of his service wages increasing from time to time and ample to enable him to keep himself modestly but independently and be proud of his position. And if the apprentice fulfils his pact (which he must do to pass his annual tests) the master will have in him, not an incubus, but a useful hand well worth his wage and salt. The assiduous apprentice can reduce the binding time from seven to six years—a direct forward step—and at the end can become, on passing the final test, a Registered Plumber and a member of his union at the age of twenty-one—a journeyman in fact at the full current rate of wage. We should like to see as an integral part of this excellent scheme some definite inducement held out to the youth to begin so honourable a career by fulfilling his first two years in the technical school. It is just at that time the greedy or indifferent parent may be tempted by the immediate possible wage to put the boy into some blind alley occupation leading nowhere at youth's most impressionable age. Herein precisely might the State, either directly or through the local authority, step in to assure some form of Maintenance Grant on certain definite conditions, such conditions in this case being amply fulfilled by the signing of the apprenticeship indenture. A limited number of such grants for two years of a comparatively small annual sum would be money well laid out, and we commend the proposition warmly to the Education Authorities as a practical and, as regards the Commonweal, a remunerative method of overcoming what in the pre-war generation proved a source of evil and weakness—often of distress and disaster—to promising youth.

We have more than once referred to Registered Plumbers, and must go a step further in the matter in concluding this article. The City of London has, through the Worshipful Company of Plumbers, done a great work in establishing and fostering a sound system of Registration among plumbers, not only in London but in the provinces, and in Scotland and Ireland also. It is probably due only to the apathy of the general public already alluded to above that this system has not become universal long ago. A plumber can only become registered by passing definite practical and theoretical tests which ensure his competency. Well may one ask why such a test of competency is not compulsorily demanded by every employer of plumbers, be he of the general public, or architect or tradesman. The public has the matter in its own hands. The organisation is there, is in working order, and effectively complete. It is fully protected. No man can call himself a Registered Plumber who does not hold the current Certificate, renewable annually. The Company of Plumbers has gone a step further and introduced a system, mindful of the best days of the great City guilds. This is the "Marked Work" system, protected by a mark sanctioned by the Board of Trade. The registered plumber sets his number upon each piece of work he deals with, and thus signs it as an artist his picture. The good plumber is proud to do so, and thus to identify himself with his craftsmanship. The general adoption of such a simple system would be finally effective in checking, if not finally eradicating, slovenly and inefficient workmanship in dark corners, which too often evade the architect's or clerk of works' best vigilance. The extra cost is virtually nil, about 1½ per cent. upon the outlay, and well worth it.

The registration system, though originated by the Plumbers' Company, is now worked by an independent Council, with a management committee chiefly composed of master and operative plumbers from all over these islands, elected from time to time. The register is kept by the Company. Associated with the plumbers is a sprinkling of Health, Water, and Public authorities. It is rightly held that where the public health is at stake these authorities ought to have some voice. The plumbers' fraternity shows a broad-minded spirit, worthy of its important craft, in recognising the value and importance of this public representation. It obviously adds materially to the status, not only of the registration system, but of the plumbers' industry itself.

The City companies have, in recent years, contributed widely to the public weal in many ways, each after its own manner. The Carpenters' and the Plumbers' Companies have perhaps done more than any others in direct furtherance of the interests of the building trade. It is interesting, finally, to note, that while plumbers' registration had its birth in the City of London, it is perhaps to-day most virile and successful in Scotland, and particularly in Glasgow. The Scot has a way of seizing and making his own a fertile idea, and may be trusted with a clear vision in such matters.

We give beneath the schedule indicating the practical application of the Scheme as regards apprentices:—

(*a*) Lads to be apprenticed to the General Council after leaving the elementary school (14 years old), the first two years' apprenticeship being directly to the General Council.

In certain cases lads may be apprenticed to a master at an earlier age than 16, subject to special regulations for attendance at evening Technical Classes.

(*b*) For such first two years of apprenticeship, lads shall attend the full courses of a Technical Institute.

(*c*) At the beginning of the third year, if no release has had effect, lads to be apprenticed to a master.

(*d*) Third and fourth years to be spent with qualified operatives on the works at rates of wages respectively 5d. and 6d. per hour.

(*e*) For the fifth and sixth years the apprentices to be employed at 8d. and 10d. per hour respectively, with a mate to assist them.

(*f*) At the beginning of the seventh year apprentices may become qualified plumbers at the standard rate of wages, provided they have passed the 1st Class Honours Certificate in Plumbers' Work of the City and Guilds of London Institute, or other the authorised examination, whereby they will be qualified to become registered on reaching the age of 21, under the National Registration of Plumbers.

(*g*) The above will be dependent upon apprentices qualifying themselves regularly for the examinations prescribed by the scheme.

### Welsh Housing and Development Association Cottage Design Competition.

The Council of the Society of Architects are in communication with the promoters in regard to Clauses 5 and 21 of the conditions of the competition which, in the opinion of the Council, are not in accordance with the competition regulations adopted by the Society. Members of the Society are requested not to take any part in the competition without first ascertaining from the Society that the conditions have been amended to meet the views of the Council.

## RATES OF WAGES IN THE BUILDING TRADE.

THE following are the present rates of wages in the Building Trade in the principal towns of England and Wales. It must be understood that, while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur :—

| | Masons. | Bricklayers. | Carpenters, Joiners. | Plasterers. | Slaters. | Plumbers. | Painters. | Masons' Labourers. | Bricklayers' Labourers. | Plasterers' Labourers. |
|---|---|---|---|---|---|---|---|---|---|---|
| | d. | d. | d. | d. | d. | d. | d. | d. | d. | d. |
| Aberdare | 11 | 11 | 11 | 11 | 11 | 10½ | 10 | 8 | 8 | 8 |
| Accrington | 11½ | 11½ | 1/- | 1/- | 1/- | 10 | 9½ | 8 | 8 | 8 |
| Altrincham | 1/2 | 1/2 | 1/3 | 1/2 | 1/- | 1/4 | 1/3 | 11 | 11 | 10 |
| Ashton-under-Lyne | 1/3 | 1/3 | 1/2½ | 1/2 | 1/2 | 1/4 | 1/3 | 10½ | 10½ | 11½ |
| Barnsley | 1/0½ | 11½ | 11½ | 1/- | 1/- | 1/- | 9½ | 9½ | 9½ | 9½ |
| Barrow-in-Furness | 1/2½ | 1/2½ | 1/2½ | 1/2½ | 1/2½ | 1/2½ | 1/2 | 1/- | 1/- | 1/- |
| Barry | 1/- | 1/- | 1/- | 1/- | — | 1/- | 11 | 9 | 9 | 9 |
| Bath | 11½ | 11½ | 11½ | 11 | 11 | 11½ | 10½ | 9 | 9 | 9 |
| Bedford | 11 | 11 | 11 | 11 | 11 | 11 | 9 | 9 | 9 | 9½ |
| Birkenhead | 1/2 | 1/2 | 1/3 | 1/2 | 1/2 | 1/3 | 1/2 | 10½ | 11½ | 11½ |
| Birmingham | 1/1½§ | 1/1½§ | 1/1½§ | 1/1½§ | 1/1½§ | 1/1½§ | 1/0§ | 10½§ | 10½§ | 10½§ |
| Bishop Auckland | 11 | 11 | 11 | 11 | 1/2 | 11 | 10 | 8 | 8 | 8½ |
| Blackburn | 1/1 | 1/1½ | 1/1½ | 11 | 1/0½ | 1/1½ | 1/- | 8½ | 9 | 9 |
| Blackpool | 1/- | 1/2 | 1/2 | 10½ | 8½ | 1/- | 10½ | 8 | 8 | 8 |
| Bolton | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/3 | 1/3 | 9½ | 9½ | 10 |
| Bournemouth | 11 | 11 | 11 | 11 | 11 | 11 | 10½ | 8½ | 8½ | 8½ |
| Bradford | 1/2½ | 1/2½ | 1/2 | 1/2½ | 1/2½ | 1/3 | 1/1 | 1/- | 1/- | 1/- |
| Bridgwater | 10 | 10 | 10 | 10 | 10 | 10 | 8½ | 7 | 7 | 7 |
| Brighton | 1/- | 1/- | 1/- | 1/1½ | 1/- | 1/- | 10½ | 9½ | 9½ | 9½ |
| Bristol | 1/2½ | 1/2½ | 1/2½ | 1/2½ | — | 1/2½ | 1/1½ | 11½ | 11½ | 11½ |
| Burnley | 1/0½ | 1/0½ | 1/0½ | 1/- | 1/- | 1/2 | 1/- | 8½ | 8½ | 8½ |
| Burton-on-Trent | 11 | 11 | 11 | 11 | 11 | 11 | 10½ | 8½ | 8½ | 8½ |
| Bury | 1/2 | 1/2 | 1/2 | 1/3 | 1/1 | 1/2 | 1/3 | 10 | 10½ | 10½ |
| Cambridge | 11 | 10½ | 10½ | 10½ | 10½ | 11 | 9 | 7½ | 7½ | 7½ |
| Cardiff | 1/1½ | 1/1½ | 1/1½ | 1/1½ | 1/1½ | 1/2½ | 1/0½ | 10½ | 10½ | 10½ |
| Chatham | 10½ | 11 | 11 | 11 | 11 | 11 | 9½ | 8 | 8 | 8 |
| Chelmsford | 8 | 7½ | 8½ | 9 | — | 9½ | 6½ | 5 | 5 | 6½ |
| Cheltenham | 9½ | 9½ | 9½ | 9½ | — | 9½ | 9½ | 6½* | 6½* | 6½ |
| Chester | 11½ | 1/- | 1/- | 1/- | 1/- | 1/- | 11½ | 7½ | 8½ | 8½ |
| Chesterfield | 1/- | 1/2 | 1/- | 11 | 10 | 11 | 1/- | 8-8½ | 8-8½ | 8-8½ |
| Colchester | 10 | 10½ | 10½ | 11 | 10 | 11 | 8½ | 7½ | 7½ | 7½ |
| Coventry | 1/2 | 1/2 | 1/2½ | 1/2 | 1/2 | 1/2½ | 1/1 | 11½ | 11½ | 1/0½ |
| Crewe | 10 | 10 | 10 | 10 | 10 | 9½ | 10 | 7 | 7 | 7½ |
| Darlington | 1/1 | 1/1 | 1/1 | 1/1 | 1/2 | 1/- | 1/- | 10 | 10 | 10 |
| Derby | 1/- | 1/- | 1/- | 1/- | 1/- | 11½ | 11½ | 9 | 9 | 9½ |
| Doncaster | 10½ | 1/- | 1/- | 10½ | 10½ | 10 | 9½ | 9½ | 9½ | 9½ |
| Dudley | 9½ | 1/- | 1/- | 10 | 10 | 9½ | 8½ | 9 | 9 | 9½ |
| Durham | 10½ | 10½ | 10½ | 10½ | 10½ | 9½ | 9 | 7½ | 7½ | 7½ |
| East Glam. and Mon. Valleys | 10 | 10 | 10 | 10 | — | — | 9 | 7 | 7 | 7 |
| Exeter | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 8 | 8 | 8 |
| Folkestone | 1/- | 1/- | 1/- | 1/- | 1/- | 1/- | 10 | 9 | 9 | 9 |
| Gloucester | 10½ | 11 | 11 | 10½ | 10½ | 11 | 10 | 8½ | 8½ | 8½ |
| Grantham | 9½ | 10 | 9½ | 9½ | 10 | 8½ | 8 | 8 | 7½ | 8 |
| Grays | — | 1/- | 1/- | — | — | 1/- | 10½ | — | 10 | 10 |
| Grimsby | 11½ | 1/- | 1/- | 1/- | 1/- | 1/- | 10 | 10 | 10 | 10 |
| Great Yarmouth | 10 | 10 | 10 | 10 | 10 | 10 | 8½ | 7 | 7 | 7 |
| Halifax | 1/1½ | 1/1½ | 1/1½ | 1/1½ | 1/1½ | 1/2 | 11 | 10½ | 10½ | 10½ |
| Harrogate | 10½ | 9½ | 11 | 9 | 8 | 1/- | 9½ | 7½ | 7½ | 7½ |
| Hartlepools | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 10½ | 1/- | 11 | 11 | 11 |
| Hastings | 10 | 10 | 10 | 10 | 10 | 10 | 8½ | 7 | 7 | 7 |
| Hereford | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7½ | 7½ | 7½ |
| Huddersfield | 1/2½ | 1/2½ | 1/3 | 1/- | 1/- | 1/2 | 11 | 11½ | 11½ | 11½ |
| Hull | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 | 1/1½ | 1/1 | 1/1 | 1/1 |
| Ipswich | 1/- | 1/- | 1/- | 1/0½ | 1/- | 1/0½ | 10½ | 9½ | 9½ | 9½ |
| Lancaster | 1/- | 1/- | 1/- | 1/- | 1/- | 1/- | 1/- | 10 | 10 | 10 |
| Leamington Spa | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 9½ | 7½ | 7½ | 7½ |
| Leeds | 1/2½ | 1/2½ | 1/2 | 1/2 | 1/2 | 1/3 | 11½ | 11½ | 11½ | 1/- |
| Leicester | 1/1 | 1/1 | 1/1 | 1/1 | 1/1½ | 1/1 | 11½ | 10½ | 10½ | 11 |
| Lincoln | 10½ | 1/- | 10½ | 10½ | 10½ | 10½ | 10 | 9½ | 9½ | 9½ |
| Liverpool | 1/2 | 1/2 | 1/2 | 1/2 | 1/1½ | 1/3 | 1/1½ | 10½ | 10½ | 10½ |
| Llanelly | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/3 | 11½ | 10½ | 10½ | 10½ |
| London | 1/3½ | 1/3½ | 1/3½ | 1/3½ | — | 1/3½ | 1/0½ | 11½ | 11½ | 11½ |
| Loughborough | 10 | 10 | 10½ | 10 | 10 | 10 | 9 | 8½ | 8½ | 9½ |
| Luton | 10½ | 10½ | 10½ | 11½ | 10½ | 11 | 9½ | 8 | 8 | 9 |
| Maidstone | 11 | 11 | 11 | 10 | 10 | 11 | 10 | 8 | 8 | 8 |
| Manchester | 1/3 | 1/3 | 1/3 | 1/3 | 1/2 | 1/4 | 1/3 | 11 | 11½ | 11½ |
| Mansfield | 11 | 11 | 10½ | 11 | 11 | 10½ | 11 | 8 | 8 | 8 |
| Merthyr Tydfil | 11 | 11 | 11 | 11 | 11 | 11 | 10 | 8½ | 8½ | 8½ |
| Middlesbrough | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/0 | 11 | 11 | 11 |
| Newcastle-on-Tyne | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/1 | 1/1 | 11 | 11 | 11 |
| Newport, Mon. | 11½ | 11½ | 11½ | 11½ | 11½ | 1/2 | 10½ | 8½ | 8½ | 8½ |
| Northampton | 1/- | 1/- | 1/- | 1/- | 1/- | 1/- | 11 | 9½ | 9½ | 9½ |
| Norwich | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 9½ | 8 | 8 | 8 |
| Nottingham | 1/2½ | 1/2½ | 1/2½ | 1/2½ | 1/2½ | 1/2½ | 1/3 | 1/1½ | 1/0½ | 1/0½ |
| Oldham | 1/2 | 1/2 | 1/2 | 1/2 | 1/- | 1/2 | 1/3 | 10½ | 10½ | 11 |
| Oxford | 11 | 10½ | 10½ | 10½ | 10½ | 10½ | 9½ | 8 | 8 | 8 |
| Plymouth | 1/2* | 1/2* | 1/2* | 1/2* | 1/2* | 1/2* | 8½* | 8½ | 8½ | 8½ |
| Pontypridd | 11 | 11 | 11 | 11 | 11 | 11 | 10 | 9½ | 9½ | 9½ |
| Portsmouth | 1/- | 1/- | 1/- | 1/- | 1/- | 1/- | 10 | 9½ | 9 | 9 |
| Preston | 1/- | 1/0½ | 1/- | 1/- | 1/- | 1/- | 1/- | 8½ | 7½* | 7½* |
| Reading | 10½ | 10½ | 10½ | 11 | 10½ | 10½ | 9 | 7½* | 8 | 8 |
| Rochdale | 1/2 | 1/2 | 1/2 | 1/1 | 1/1 | 1/2 | 1/3 | 10½ | 10½ | 11 |
| Rochester | 10½ | 11 | 11 | 11 | 11 | 11 | 9½ | 8 | 8 | 8 |
| Rugby | 1/- | 1/- | 1/- | 1/0½ | 1/1 | 1/- | 11 | 9 | 9 | 10 |
| St. Albans | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 8 | 8 | 8½ |
| St. Helen's | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/1 | 8 | 8 | 8 |
| Scarborough | 9½ | 9½ | 9 | 9½ | 9½ | 9½ | 8½ | 9 | 9 | 9 |
| Sheffield | 1/2½ | 1/2½ | 1/2½ | 1/2½ | 1/2½ | 1/2½ | 1/1½ | 11½ | 11½ | 11½ |
| Shrewsbury | 8½ | 11½ | 1/3 | 9½ | — | 8½ | 7 | 8½ | 8½ | 8½ |
| Southampton | 1/0½ | 1/0½ | 1/0½ | 1/0½ | 1/0½ | 1/0½ | 11½ | 9½ | 9½ | 9½ |
| Southend-on-Sea | 10 | 10 | 10 | 10 | P'cework | 10 | 9 | 8 | 8 | 8 |
| Southport | 1/2 | 1/1 | 1/- | 1/- | 1/- | 1/1 | 1/1* | 1/1 | 10 | 10 |
| South Shields | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/1* | 1/1 | 11 | 11 | 11 |
| Stockport | 1/3 | 1/2½ | 1/2½ | 1/- | 1/1½ | 1/2 | 1/3 | 10 | 10 | 10 |
| Stockton-on-Tees | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 10½ | 1/- | 11 | 11 | 11 |
| Stoke-on-Trent | 11½ | 11½ | 11½ | 11½ | — | 10½ | 10½ | 8½ | 8½ | 8½ |
| Stroud | 9½ | 9½ | 9½ | 9½ | 9½ | 9½ | 9 | 7½ | 7½ | 7½ |
| Sunderland | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/1½ | 1/1 | 11 | 11 | 11 |
| Swansea | 1/1½ | 1/1½ | 1/1½ | 1/1½ | 1/1½ | 1/2 | 1/1 | 10½ | 10½ | 10½ |
| Taunton | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7½ | 7½ | 7½ |
| Torquay | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 8 | 8 |
| Wakefield | 10 | 1/- | 11½ | 1/- | 1/- | 1/1 | 1/- | 9½ | 9½ | 9½ |
| Walsall | 1/1½ | 1/1½ | 1/1½ | 1/1½ | 1/1½ | 1/1½ | 1/- | 11½ | 11½ | 11½ |
| Warrington | 1/3 | 1/3½ | 1/3 | 1/3½ | 1/3½ | 1/3 | 1/2 | 11 | 11½ | 11½ |
| West Bromwich | 11 | 11 | 10½ | 10½ | — | 10 | 9 | 8 | 8 | 8 |
| Wigan | 1/1½ | 1/2 | 1/1½ | 1/1½ | 1/0½ | 1/1½ | 1/3 | 10½ | 11 | 11 |
| Windsor | 1/- | 1/- | 1/- | 1/- | 1/- | 1/- | 10½ | 9 | 9 | 9 |
| Wolverhampton | 1/-§ | 1/-§ | 1/-§ | 1/-§ | 1/-§ | 1/-§ | 10½§ | 9§ | 9§ | 9§ |
| Worcester | 9½ | 1/- | 1/- | 1/- | 1/- | 1/- | 10 | 10½ | 10½ | 10½ |
| York | 1/- | 1/- | 1/- | 1/- | 1/- | 10½ | 9½ | 9½ | 9½ | 9½ |

The Masons' rate given is for bankers; fixers usually ½d. per hour extra.
* War bonus of 2s. per week granted. † War bonus of 3s. per week granted. ‡ War bonus of 3s. 6d. per week granted.
§ War bonus of 6s. per week granted. § 1½d. per hour extra for men engaged on munition work.

## PROBLEM OF SMALL HOUSES.

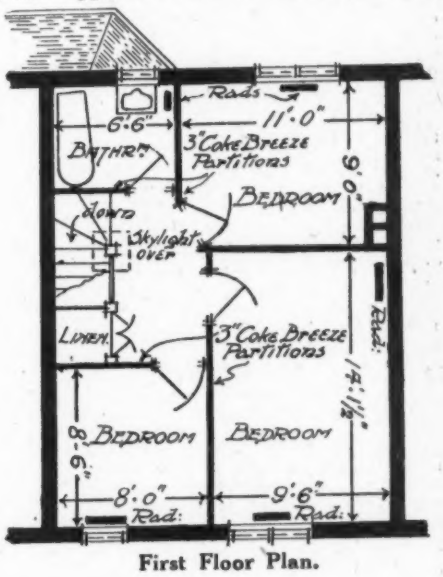
We have received the following letter on this subject :—

SIR,—As one who has given a considerable amount of study to the designing of small houses and cottages, I was greatly interested in the article in your issue of the 29th ult.

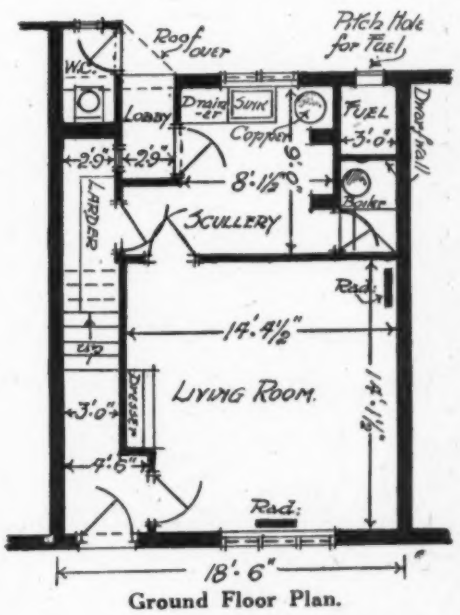
I have, for some years, advocated the use of low-pressure hot-water heating for dwelling-houses, but have invariably been met by a refusal, on the part of owners, to depend on hot-water heating alone; they have generally insisted on the fireplace in addition in every room, even the bedroom. I find the fetish of the open fire a very hard one to overcome.

I do not see why the system of hot-water heating should not be adopted, even in the smallest house, and the matter should be carefully considered by all architects, the saving of fuel being a national question; also the housewife will find that dust will practically disappear with the abolition of the open fire-grate.

I have pleasure in enclosing a design for a small terrace-house with a heating chamber adjacent to the scullery. A circulating tank is fixed above the boiler, for the hot-water supply to bathroom and sink, the radiators, of course, being connected direct to the boiler, which should be fitted with a "summer grate," thus saving fuel in summer, when only the hot water supply to bath and sink is required.




First Floor Plan.




Ground Floor Plan.

The fireplace opening is designed to accommodate a cooking range; but in all districts where gas is available the opening could be made just sufficiently wide for a gas-cooker.

J. E. LAYBOURN.

## PROPOSED NEW BUILDINGS AND OTHER WORKS.*

IN these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works, at the time of publication, have been actually commenced. Abbreviations:—T.C. for Town Council; U.D.C. for Urban District Council; R.D.C. for Rural District Council; E.C. for Education Committee; L.G.B. for Local Government Board; B.G. for Board of Guardians; L.C.C. for London County Council; B.C. for Borough Council; and P.C. for Parish Council.

AYLESBURY.—Plans passed by T.C.:—Additions, 35, Bicester-road, for Mr. James Putman; alterations to strengthen house, Friarage-road, for Messrs. Smith & Sons; drainage of buildings adjoining Dominion Dairy Company's works, for Mr. James Putman. A plan by the Borough Surveyor for sewer through the Great Western and Great Central Railways has been approved.

CAMBERWELL.—Drainage plans passed by B.C.: At 19, Adys-road, for Mr. Sehilling; at 17, Adys-road, for Mr. Donnewald; at 2, 4 & 6, Grove-vale, for Messrs. Martin & Co.; at 119, Peckham Park-road, for Mr. Young; at 65, Lordship-lane, for Mr. Cates.

DEPTFORD.—Plan passed: Sanitary accommodation, 26, Knott-street, for Mr. H. Kent.

DEWSBURY.—Plans passed by T.C.:—Additions, Thornhill Edge, for the Working Men's Club; brick chimney, Savile Town Chemical Works, for J. Brown & Co., Ltd.; economiser, Globe Mills, for Graham & Cope, Ltd.; garage, Grove-street, for Messrs. H. Sykes & Co., A sub-committee of the Corporation has been appointed to select sites for the erection of working class houses.

EBBW VALE.—It is understood that the Ebbw Vale Company are building fifty houses at the garden suburb, and that other plans are ready for building another 500 houses. It is also reported that they propose to bring into operation a single man's hostel for the accommodation of 500 persons.

FULHAM.—Drainage plans passed by B.C.: At premises of Van Den Plas, Ltd., Normand-road, for J. Garlick. Ltd.; at Van den Bergh's factory, Townmead-road, for Mr. W. W. Wright; at 152, Bishop's-road, for Messrs. Swan Bros.

HAMMERSMITH.—Drainage plans passed by B.C.:—At 8a, Hythe-road, for Messrs. Lennell, Lane & Bettridge; at Atlanta Wharf, for Mr. E. Cannell; at 22, Cathnor-road, for Mr. H. Wood. The T.C.C. has approved of a building in Curwen-road, for Mr. Llewellyn Dent.

HEXHAM.—With reference to the circular from the L.G.B. requesting to be informed of any works likely to be undertaken on the conclusion of the war, the U.D.C. recommends that the scheme for widening, diverting, and making up Haugh-lane, the housing scheme, and the extension of the cemetery be included in the return.

HULL.—Plans passed by T.C.:—Messrs. Gemmell & Frow, workshop, Plane-street; Messrs. Thompson, Cook & Babington, additions, Parliament-street; Messrs. Lambert & Co., Ltd., alterations, 19, Whitefriargate; Messrs. G. & A. E. Slingsby, water closet, Cumberland-street; Messrs. Clark & Co., additions, Waterhouse-lane; Mr. F. Minns, shed, 10 and 12, Church-street; Hull Forge Iron and Steel Co., Ltd., additions, Cannon-street; Messrs. Sands & Son, additions, Wincolmlee; Messrs. Holliday & Barker, workshop, Wright-street. Plans are also before the Council for a shed, 55, Scott-street, for Mr. W. Brest; chimney, Morley-street, for Messrs. Reckett & Sons, Ltd.; and alterations to houses, Oxford-terrace, Williamson-street, for Messrs. Priestman Bros.—It is proposed that the Corporation should renew the lease of the Alexandra Hotel, Kingston-street, to Messrs. Worthington & Co., on condition that the Company spends not less than £2,500 in rebuilding the premises.

KINGHORN.—The T.C. has under consideration proposals for carrying out certain town-planning schemes.

LUTON.—Plans passed by T.C.:—Fricker's Metal Co., chimney shaft, Portland-road; T. Balmforth & Co., Ltd., extension of foundry, Pondwicks-road; W. G. Durrant, garage, Hazelbury-crescent; Thermo-Electric Ore Reduction Corporation, Ltd., internal alterations to lavatories, Hitchin-road.—The Borough Engineer has submitted a plan for a footpath tunnel under the railway on each side of the Waldeck-road bridge, and reported that, at present prices, the cost would be about £1,000 for each side. It was decided that the matter be further considered after the views of the Midland Railway Company have been obtained in regard to the proposal.

NEWTON-IN-MAKERFIELD.—Messrs. R. Evans & Co., Ltd., and the Vulcan Foundry Co. have written to the U.D.C. regarding the shortage of houses in the district and stating that they are prepared to support the Council's proposals for the erection of working class dwellings.

OTLEY.—The Otley D.C. has agreed to apply to the L.G.B. for sanction to borrow money for the acquisition of twenty-three acres of land in Weston-lane, and for the erection of houses for the working classes.

STRETFORD.—Plans passed by the U.D.C.:—Shop front, King-street, for Mr. Timothy Royle; shed, Elsinore-road, for Messrs. Robert Carlyle & Co., Ltd; machine shop, Elsinore-road, for Messrs. Marcus Allen & Sons; warehouse (V), Westinghouse-road, for the Trafford Park Estates, Ltd.; latrines, Westinghouse-road, for Messrs. Redpath, Brown & Co., Ltd.

SWANSEA.—Plans approved:—One house, Fern-street, for Messrs. J. & F. Weaver; and additions, 4, Picton-place, for Messrs. J. H. Nott & Sons.

WOLVERHAMPTON.—Plans passed by T.C.: A. W. Sutton, foundry, Forward Works, Eagle-street; John Marston, Ltd., new floor, warehouse, Ablow-street; W. Pearson, sanitary accommodation, Wanderers'-avenue; Hobran Engineering Co., Ltd., foundry, stores, kitchen and bath-room, Shelsley Works, Bilston-road; Clyno Engineering Co., chimney stack and power house, Southampton-street; J. Hickman & Sons, new offices, land off Cannon-street; J. Davis, temporary warehouse. Penn-street; Johnson & Phipps, sanitary accommodation and raise boundary wall, Wheatsheaf Inn, Great Brickkiln-street; T. and C Clark & Co., store and alterations, Shakespeare Foundry, Horseley-fields; T. E. Hallows, pig sty, 337, Newhampton-road West; Mrs. E. M. Hill, pig sty, 261, Tettenhall-road; the Briton Motor Co., Ltd., sanitary accommodation, Walsall-street; E. White, motor-house, Parkdale.

WOOLWICH.—A general hospital is to be built, as a memorial to Woolwich men who have fallen in the war.

* See also our list of Competitions, Contracts, &c., on this page.

## PATENTS.

APPLICATIONS PUBLISHED.*

104,691.—Lazarus White: Method of providing sub-structures for structures.

107,765.—Paul Goiffon: Elements for constructional purposes.

111,485.—Denis Volant: Waterproof material for use in constructional purposes as a substitute for leather, for street paving, &c.

113,671.—Alexander Mackie and John Mackie: Rope grips.

113,689.—Andrew Dods: Voussoirs for the construction of circular and arched masonry and brick and block work.

113,710.—Bertram Edward Dubar Kilburn (Sulzer Freres Soc. Anon.): Hot water heating systems.

113,725.—Sidney George Palmer: Sheets or slabs for building and roofing purposes.

113,730.—Peter John Marfell: Method and apparatus for automatically balancing cranes.

113,800.—Laurence Maxwell Waterhouses: System of, and apparatus for, wiring ships, buildings, &c., for the distribution of electricity.

113,810.—Harold Stiener Ashenhurst: Porous composition or matter for use in heat insulation and for other purposes.

113,824.—Lionel Henry Teale: Domestic fireplaces.

113,840.—Benham & Sons, Ltd., and Charles Reed Allensby: Heat radiators.

113,849.—John Parker: Domestic fire-places.

113,864.—Richard Paul Fisher: Domestic fire-grates or stoves.

113,871.—William Alfred Adlam and John Daniel Daniels: Brick or block for building or constructional purposes.

113,873.—Nicolay Knudtzon Fougner: Construction of ships or vessels of reinforced concrete.

113,907.—William Lundberg Finne: Pipe joints.

113,925.—George Furuholmen: Stoves.

113,938.—Edward Bullock Rogers: Method of and means for locking nuts to bolts and studs.

114,008.—Joseph Baty Mattinson: Device for use in the application of rollers to doors, and for other analogous purposes.

114,059.—Arthur Benham and Thomas Freebairn-Smith: Reinforced concrete.

114,067.—Robert Mackay: Arrangements by which the resilience in coiled springs is used to effect the moving of a gate in any desired direction.

114,086.—Thomas Walker Hargreaves: Baths.

114,100.—William Dare Cooksley: Doors and gates.

114,123: Eigil Aage Hansen: Low-water alarms for steam boilers.

114,133.—John Ernest Walker: Devices for stopping bursts or leaks in pipes.

*** All these Applications are now in the stage in which opposition to the grant of Patents upon them may be made.**

## Competitions, Contracts, &c.

**For some contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this number. Contracts, —; Competitions, —; Public Appointments, xviii; Auction Sales, —.** Certain conditions beyond those given in the following information are imposed in some cases, such as that advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

### BUILDING AND PAINTING.

APRIL 22.—**Newcastle-on-Tyne.**—OFFICE.—The Corporation invite tenders for the construction of an office adjoining the iron shed at No. 2 Berth, Newcastle Quay, close to Swing Bridge. Forms, &c., at the City Engineer's Office, Town Hall.

APRIL 30.—**Menai Bridge.**—PAINTING.—The Commissioners of H.M. Works and Public Buildings invite tenders for the painting of the Menai Bridge, North Wales. Forms of the Chief Engineer, H.M. Office of Works, Storey's Gate, London, S.W. 1; or of the Bridge Keeper at the Menai Bridge.

### ENGINEERING, IRON AND STEEL.

APRIL 24.—**Manchester.**—WIDENING OF VIADUCT.—Manchester Corporation Electricity Committee invite tenders for the widening of the railway viaduct from Stuart-street to Bank-street, Clayton. Plans, &c., at the City Engineer's Office, Town Hall, Manchester. Deposit, £2 2s.

MAY 1.—**Torcross (Devon).**—SEA DEFENCE WALL.—Devon C.C. invite tenders for certain works, consisting of a sea defence wall at Torcross, in the parish of Stokenham, South Devon. Specification, &c., of Mr. Brian S. Miller, Clerk of the Devon County Council, The Castle of Exeter.

### ROAD, SANITARY, AND WATER WORKS.

APRIL 25.—**Folkestone.**—TAR MACADAM.—The Corporation invite tenders for providing and laying tar macadam in Radnor Park road and Sandgate-road, Folkestone. Specification from the Borough Engineer, Corporation Offices, Church street, Folkestone.

## Public Appointments.

*APRIL 27.—LIVERPOOL.—The Education Committee of the City of Liverpool require the services of four teachers. Forms of application and further particulars may be obtained from the Director of Education, Education Offices, Sir Thomas street, Liverpool.

## BOOK.

*Building Construction Drawing.* Part III. By RICHARD B. EATON. (London: E. & F. N. Spon, Ltd., 57, Haymarket. Price 3s.)

THIS book is intended as a class book for the elementary student and artisan, and it is arranged as a series of plates to which specifications and notes are attached giving details of sizes and methods of execution. The work here illustrated and described deals with the more advanced subjects, as the book is intended to form a continuation of the two parts previously published.

The features dealt with include a mansard roof truss, octagonal and circular towers, bay window, lantern light, small bungalow with details and a villa residence. The last mentioned is accompanied by a complete specification, and this should be useful to the student as an example of working with drawings and specification together.

The work is very practical in many respects; but we think the author would have increased the value of the book if the designs generally had possessed a little more merit from the architectural point of view. Also there are some instances in which the grounds for joinery fixing are not shown on the details, clearance for panels is omitted, and similar small points have been overlooked, and this is to be regretted in a book which is essentially practical in character.

The large amount of timber which is employed throughout for construction would not be possible in these days when the scarcity is so serious, and some modifications would be necessary to make the examples conform with conditions which are now imposed upon the building industry.

# PRICES CURRENT OF MATERIALS.

**[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry. Since our last issue several prices have been revised—Ed.]**

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

## BRICKS, &c.

| Per 1,000 Alongside, in River Thames. | £ s. d. |
|---|---|
| Best Stocks | 2 10 0 |
| Picked Stocks for Facings | 3 5 0 |

| Per 1000, Delivered at Railway Depot, London. | £ s. d. | | £ s. d. |
|---|---|---|---|
| Flettons | 2 3 0 | Best Blue Pressed Staffordshire | 6 10 0 |
| Best Fareham Red | 4 0 0 | Do. Bulinose | 6 15 0 |
| Best Red Pressed Ruabon Facing | 6 0 0 | Best Stourbridge Fire bricks | 9 5 0 |

| GLAZED BRICKS— | | | |
|---|---|---|---|
| Best White, Ivory, and Salt Glazed Stretchers | 14 17 6 | D'ble Str'tch'rs | 20 7 6 |
| | | D'ble Headers | 17 7 6 |
| Headers | 14 7 6 | One Side and two Ends | 21 7 6 |
| Quoins, Bullnose and 4½in. Flats | 18 7 6 | Two Sides and one End | 22 17 6 |
| | | Splays and Squints | 19 17 6 |

Glazed bricks priced at so much each, 25 per cent. advance on list.

Second Quality, £1 per 1,000 less than best.

| | s. d. | |
|---|---|---|
| Thames Ballast | 11 0 | per yard, delivered |
| Pit Sand | 13 0 | |
| Thames Sand | 13 6 | 2 miles radius |
| Best Washed Sand | 14 0 | Paddington. |
| ¾ in. Shingle for Ferro-Concrete | 12 0 | |

| Per ton, delivered. | £ s. d. | £ s. d. |
|---|---|---|
| Best Portland Cement | 2 18 0 .. | 3 1 0 |

Do. £2 11s. 0d. alongside in 80-ton lots.
Ferrocrete 2s. 6d. per ton extra on above.
Best Ground Blue Lias Lime 1 13 6 at rly. depot.
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks. The sacks are charged at 2s. 3d. each and credited at 2s. each if returned in good condition within three months.
Grey Stone Lime ..... 47s. 0d. per ton delivered.
Stourbridge Fireclay in s'cks 37s. 6d. per ton at rly. dpt.

## STONE.

| | s. d. |
|---|---|
| BATH STONE—delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube | 1 7 |
| Do. do. delivered in railway trucks at Nine Elms, L. & S.W.R., per ft. cube | 1 8½ |
| Do. do. delivered on road waggons at Nine Elms Depot | 1 9½ |
| PORTLAND STONE— Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, L.& S.W.R., South Lambeth Station, G.W.R., and Mileage Station G.W.R., per ft. cube | 2 10½ |
| Do. do. delivered on road waggons at above stations, per ft. cube | 2 11½ |
| White basebed, 2d. per ft. cube extra. | |

NOTE.—½d. ft. cube extra for every foot over 20 ft. *average.*

| RANDOM BLOCKS—Per Ft. Cube, delivered at Rly. Dpot. | s. d. | | s. d. |
|---|---|---|---|
| Ancaster in blocks | 2 0 | Closeburn Red Freestone | 2 2 |
| Beer in blocks | 1 7½ | | |
| Grinshill in blocks | 2 4 | Red & White Mansfield random block | 2 9 |
| Darley Dale in blocks | 2 5 | Yellow Magnesian Limestone do. do | 3 3 |

YORK STONE—*Robin Hood Quality.*

| Delivered at any Goods Station London. | s. d. |
|---|---|
| Scappled random blocks ..... Per Ft. Cube | 3 11 |
| 6 in. sawn two sides landings to sizes (under 30 ft. super.) ..... Per Ft. Super. | 3 0 |
| 6 in. rubbed two sides, ditto ..... „ | 3 4 |
| 3 in. sawn two sides slabs (random sizes) „ | 1 3½ |
| 2 in. to 2½ in. sawn one side slabs (random sizes) ..... „ | 0 10 |
| 1½ in. to 2 in. ditto, ditto ..... „ | 0 8½ |

HARD YORK—

| Delivered at any Goods Station London. | |
|---|---|
| Scappled random blocks ..... Per Ft. Cube | 3 6 |
| 6 in. sawn two sides landing to sizes (under 40ft. super.) ..... Per Ft. Super | 2 8 |
| 6 in. rubbed two sides ditto ..... „ | 2 4 |
| 3 in. sawn two sides slabs (random sizes) „ | 1 3 |
| 2 in. self-faced random flags ..... „ | 0 5½ |

## TILES.

| | Per 1,000 f.o.r. London. £ s. d. |
|---|---|
| Best machine-made tiles from Broseley or Staffordshire district | 3 15 0 |
| Ditto hand-made ditto | 3 17 6 |
| Ornamental ditto | 4 0 0 |
| Hip and valley tiles (per dozen) | 0 9 0 |

## SLATES.

| | | Per 1,000 of 1,200 f.o.r. London. £ s. d. |
|---|---|---|
| Best Blue Bangor Slates, | 20 by 10 | 16 10 0 |
| „ | 16 by 8 | 8 10 0 |
| First quality „ | 20 by 10 | 16 0 0 |
| „ „ | 16 by 8 | 8 2 6 |
| Best Blue Portmadoc | 20 by 10 | 16 10 0 |
| „ „ | 16 by 8 | 8 10 0 |
| First quality „ | 20 by 10 | 15 5 0 |
| „ „ | 16 by 8 | 7 12 6 |

## WOOD.

BEST BUILDING REDWOOD. Imported sizes.

*Softwood stocks controlled by the Director of Materials, consequently prices must be withdrawn*

Deals: 4 in. by 12 in., 4 in. by 11 in., 3 in. by 11 in., 4 in. by 9 in., and 2 in. by 11 in. .....
3 in. by 9 in., 2½ in. by 9 in., and 2 in. by 9 in. .....

## WOOD (*Continued*).

BEST BUILDING REDWOOD.

*Softwood stocks controlled by the Director of Materials, consequently prices must be withdrawn.*

Battens: 2 in., 2½ in., and 3 in. by 8 in. .....
2 in., 2½ in., and 3 in. by 7 in. .....
2 in., 2½ in., and 3 in. by 6 in. .....
Scantlings: 2 in. by 3 in., 2 in. by 3½ in., 2 in. by 4 in., 2 in. by 4½ in. ...
3 in. by 4 in., and 3 in. by 4½ in. .....
Boards: 1 in., 1½ in., and 1½ in. by 6 in. and 7 in.
¾ in. .....
Seconds .....
Sawn pitch pine logs (about 35 cu. ft. average .....
Do. 6 in. to 10 in. ..

Best Pitch Pine Deals ....
Under 2 in. thick .....

JOINERS' WOOD

| White Sea First Quality | Sizes up to and including 2 in. Tubes. | Fittings. | Sizes 2½ in. to 6 in. Tubes. | Fittings. |
|---|---|---|---|---|
| Red: 4 in. by 11 in. | 36½ | 40 | 41½ | 42½ |
| 3 in. by 11 in., and 2 in. by 11 in. | 31½ | 37½ | 36½ | 40 |
| 4 in. by 9 in. | 26½ | 35 | 31½ | 37½ |
| 3 in. by 9 in., and 2½ in. by 9 in. | 13½ | 32½ | 17½ | 35 |
| 3 in. by 11 in. boards | 5 | 30 | 8½ | 32½ |
| 7 in. and 8 in. battens | 1½ on | 27 | 2½ | 30 |
| 7 in. and 8 in. boards | | | | |

Archangel White Deals—
Best 3 in. by 9 in. and 10 in. and 11 in. .....
Seconds, do. .....
U.S. Battens .....

Prepared Floorings and Matchings. Seconds Swedish Red and equal—
1½ in. by 6½ in. planed and shot .....
1½ in. by 6½ in. planed and matched .....
1 in. by 6½ in. planed and shot .....
1 in. by 6½ in. planed and matched .....
¾ in. by 6½ in. planed, matched, and beaded, or V jointed .....
1 in. by 6½ in. do. .....
Columbian or Oregon Pine, best quality .....
Yellow Pine—First regular sizes .....
Oddments .....
Seconds, regular sizes ..
Oddments .....
Kauri Pine—Planks per ft. cube.....

| | | | | | | |
|---|---|---|---|---|---|---|
| Dry Wainscot Oak, per ft. super, as inch | 0 | 2 | 0 | .. | 0 | 2 6 |
| ¾ in. do. do. | 0 | 1 | 6 | .. | 0 | 2 0 |
| Dry Mahogany—Honduras, Tabasco, per ft. super, as inch | 0 | 2 | 6 | .. | 0 | 3 0 |
| Cuba. Mahogany | 0 | 2 | 6 | .. | 0 | 3 6 |
| Dry Walnut, American, per ft. super, as inch | 0 | 2 | 0 | .. | 0 | 3 0 |
| French, "Italian," Walnut | 0 | 3 | 0 | .. | 0 | 5 0 |
| Teak, per load (Rangoon or Moulmein) | 60 | 0 | 0 | | 85 | 0 0 |
| Do. do. (Java) | | | | | | |
| American Whitewood planks, per ft. cube | 1 | 4 | 0 | .. | 1 | 10 0 |
| Glue, per cwt. | 6 | 0 | 0 | .. | 6 | 15 0 |

## METALS.

JOISTS, GIRDERS, &c.

*Prices controlled by the Ministry of Munitions.*

Rolled Steel Joists, ordinary sections, basis price .....
Plain Compound Girders, ordinary sections .....
Plain Compound Stanchions
Angles, Tees, and Channels, ordinary sections .....
Flitch Plates .....
Cast Iron Columns and Stanchions, plain ordinary patterns .....

WROUGHT-IRON TUBES AND FITTINGS—
(Discount off List for lot of not less than £4 net value delivered direct from works. 5 per cent. less carriage forward if sent from London stocks.)

| | Sizes up to and including 2 in. Tubes. | Fittings. | Sizes 2½ in. to 6 in. Tubes. | Fittings. |
|---|---|---|---|---|
| Gas | 36½ | 40 | 41½ | 42½ |
| Water | 31½ | 37½ | 36½ | 40 |
| Steam | 26½ | 35 | 31½ | 37½ |
| Galvanised Gas | 13½ | 32½ | 17½ | 35 |
| „ Water | 5 | 30 | 8½ | 32½ |
| „ Steam | 1½ on | 27 | 2½ | 30 |

L.C.C. SOIL PIPES— London Prices ex works.

| | Pipes coated. s. d. | Bends, stock angles. s. d. | Branches, stock angles s. d. |
|---|---|---|---|
| 2 in. per yd. in 6 fts. | 3 4 | 2 6 | 3 0 |
| 2½ in. „ | 3 10 | 2 9 | 3 9 |
| 3 in. „ | 4 9 | 3 0 | 4 6 |
| 3½ in. „ | 5 3 | 3 9 | 5 3 |
| 4 in. „ | 5 9 | 4 3 | 6 0 |

RAIN-WATER PIPES, &c.

| | Pipe. s. d. | Bends, stock angles. s. d. | Branches, stock angles s. d. |
|---|---|---|---|
| 2 in. per yd. in 6fts. plain | 2 5 | 1 6 | 1 11 |
| 2½ in. „ „ | 2 6½ | 1 9 | 2 4 |
| 3 in. „ „ | 3 0 | 2 1 | 3 0 |
| 3½ in. „ „ | 3 7 | 2 5 | 3 5 |
| 4 in. „ „ | 3 11 | 2 11 | 4 2 |

L.C.C. DRAIN PIPES,—9 ft. lengths. London Prices. 4 in., 7s. 0d. ... 5 in., 8s. 6d. .. 6 in., 10s. 0d.

| Per ton in London. | £ s. d. | | £ s. d. |
|---|---|---|---|
| IRON— | | | |
| Common Bars | 16 10 0 | to | 17 0 0 |
| Staffordshire Crown Bars— good merchant quality | 16 10 0 | .. | 17 10 0 |
| Staffordshire "Marked Bars" | 18 0 0 | .. | 19 0 0 |
| Mild Steel Bars | 21 0 0 | .. | 21 10 0 |

## METALS (*Continued*).

| Per ton in London. | £ s. d. | | £ s. d. |
|---|---|---|---|
| Steel Bars, Ferro-Concrete quality, basis price | 19 10 0 | .. | 20 0 0 |
| Hoop Iron, basis price | 20 10 0 | .. | 21 0 0 |
| „ „ Galvanised | 33 0 0 | .. | — |
| Sheet Iron Black— Ordinary sizes to 20 g. | 23 0 0 | .. | 23 10 0 |
| „ „ 24 g. | 24 0 0 | .. | 24 10 0 |
| „ „ 26 g. | 25 10 0 | .. | 25 0 0 |
| Sheet Iron, Galvanised flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g. | 34 0 0 | .. | — |
| Ordinary sizes to 22 g. and 24 g. | 34 0 0 | .. | 34 10 0 |
| Ordinary sizes to 26 g. | 36 0 0 | .. | 36 10 0 |
| Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g. | 35 10 0 | .. | — |
| „ „ 22 g. and 24 g. | 36 0 0 | .. | — |
| Ordinary sizes to 26 g. | 39 0 0 | .. | — |
| Galvanised Corrugated Sheets— Ordinary sizes, 6 ft. to 8 ft. 20 g. | 33 0 0 | .. | Nominal prices only. |
| Ordinary sizes, 22 g. and 24 g. | 33 10 0 | .. | |
| Ordinary sizes, 26 g. | 32 10 0 | .. | |
| Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker | 24 10 0 | .. | — |
| Best Soft Steel Sheets, 20 g. and 24 g. | 24 15 0 | .. | — |
| Best Soft Steel Sheets, 26 g. | 26 10 0 | .. | — |
| Cut Nails, 3 in. to 6 in. | 29 0 0 | .. | 30 0 0 |

(Under 3 in., usual trade extras.)

## LEAD, &c.

| Delivered in London. | £ s. d. | | |
|---|---|---|---|
| LEAD—Sheet, English, 4 lb. and up | 38 10 0 | .. | — |
| Pipe in coils | 39 0 0 | .. | — |
| Soil Pipe | 42 0 0 | .. | — |
| Compo pipe | 42 0 0 | .. | — |

NOTE—Country delivery, 20s. per ton extra; lots under 5 cwt., 1s. 6d. per cwt. extra. Cut to sizes, 2s. cwt. extra. Orders for over 1 cwt. Sheet Lead or Pipe, or 28 lbs. Solder should be accompanied by a certificate or licence, which can be obtained from the Director of Materials [A.N.2 (E)], Hotel Victoria, S.W. Smaller quantities than the above can be obtained by making a written declaration to the Manufacturer or Merchant that the metal is wanted for urgent renewals or repairs, and giving the name of the job for which it is required.

| | | | | | |
|---|---|---|---|---|---|
| COPPER— Strong Sheet ....per lb. | 0 | 2 | 2 | .. | — |
| Thin „ .... „ | 0 | 2 | 3 | .. | — |
| Copper nails .... „ | 0 | 2 | 2 | .. | — |
| Copper wire .... „ | 0 | 2 | 3 | .. | — |
| TIN—English Ingots „ | 0 | 3 | 3 | .. | — |
| SOLDER—Plumbers' „ | 0 | 1 | 6 | .. | — |
| Tinmen's „ | 0 | 1 | 11 | .. | — |
| Blowpipe „ | 0 | 2 | 1 | .. | — |

## GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES AND IN SQUARES IN ORDINARY SIZES.

| | Per Ft. | | Per Ft. |
|---|---|---|---|
| 15 oz. fourths | 7d | 32 oz. fourths | 9d. |
| „ thirds | 7½d. | „ thirds | 10c. |
| 21 „ fourths | 7½d | Fluted, Obscured and | |
| „ thirds | 8d. | Enamelled Sheet, | |
| 26 „ fourths | 8d. | 15 oz. | 7½d. |
| „ thirds | 9d. | 21 „ | 8½d. |

Extra price according to size and substance for squares cut from stock, and only small quantities can be supplied without an A Certificate.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

| | Per Ft. |
|---|---|
| ⅛ Rolled plate | 5d. |
| 3/16 Rough rolled and rough cast plate | 5½d. |
| ¼ Rough rolled and rough cast plate | 6d. |
| Figured Rolled, Oxford Rolled, Baltic, Oceanic, Arctic, Stippolyte, and small and large Flemish white | 6½d. |
| Ditto, tinted | 7½d. |
| Rolled Sheet „ | 5½d. |
| White Rolled Cathedral | 5½d. |
| Tinted do. | 6d. |

## PAINTS, &c.

| | | £ s. d. |
|---|---|---|
| Raw Linseed Oil in pipes ..... per gallon | | 0 5 6 |
| „ „ „ in barrels .... „ | | 0 5 7 |
| „ „ „ in drums .... „ | | 0 5 10 |
| Boiled „ „ in barrels .... „ | | 0 5 10 |
| „ „ „ in drums .... „ | | 0 6 1 |

Orders for these oils must be accompanied by a certificate from the Ministry of Food (Oil and Fat Department), St. Stephen's House, Westminster, S.W.1.

| | | |
|---|---|---|
| Turpentine in barrels ..... | „ | 0 10 6 |
| „ in drums ..... | „ | 0 10 9 |
| Genuine Ground English White Lead, per ton (In not less than 5 cwt. casks.) | | 53 10 0 |
| GENUINE WHITE LEAD PAINT— "Blackfriars," "Nine Elms," "Park," and other best brands (in 14 lb. tins) not less than 5 cwt. lots | per ton delivered | 71 10 0 |
| Red Lead, Dry (packages extra) | per ton | 42 0 0 |

Orders for White and Red Lead and any Paint containing Lead must be accompanied by a certificate or licence, which can be obtained from the Director of Materials [A.N. 2 (E.)], Hotel Victoria, S.W.

| | | |
|---|---|---|
| Best Linseed Oil Putty | per cwt. | 0 16 0 |
| Filocol | per cwt. | 0 13 6 |

## VARNISHES, &c.

| Per gallon. | £ s. d. |
|---|---|
| Fine Pale Oak | 0 12 0 |
| Pale Copal Oak | 0 14 0 |
| Superfine Pale Elastic Oak | 0 16 0 |
| Fine Extra Hard Church Oak | 0 14 0 |
| Superfine Hard-drying Oak, for seats of Churches | 0 16 0 |
| Fine Elastic Carriage | 0 16 0 |
| Superfine Pale Elastic Carriage | 0 18 0 |
| Fine Pale Maple | 0 14 0 |
| Finest Pale Durable Copal | 1 0 6 |
| Extra Pale French Oil | 1 4 0 |
| Eggshell Flatting | 1 0 0 |
| White Pale Enamel | 1 6 0 |
| Extra Pale Paper | 0 14 0 |
| Best Japan Gold Size | 0 10 0 |
| Best Black Japan | 0 16 0 |
| Oak and Mahogany Stain | 0 9 0 |
| Brunswick Black | 0 8 0 |
| Berlin Black | 0 16 0 |
| Knotting | 1 10 0 |
| French and Brush Polish | 0 16 0 |

## TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 12 *noon on Wednesday.*

* Denotes *accepted.* † Denotes *provisionally accepted.*
‡ Denotes *recommended for acceptance.*

BELFAST.—For the supply of fresh-air and eliminator plates in connection with the wet-air filter, for the Corporation Tramways and Electricity Committee :—

*Sturtevant Engineering Co. ..... £60

LONDON.—For the construction of wooden partition in corridor of chapel, of gully-trap and drain, and decorative works in Superintendent's Lodge, at the Hanwell Cemetery, for the Westminster City Council :

| | Partition in Corridor of Chapel. | Gully-trap and Drain. | Decorations in Superintendent's Lodge. |
|---|---|---|---|
| | £ s. | £ s. | £ s. d. |
| Myring & Son .. .. | ‡28 10 | 17 18 | 28 0 0 |
| A. Jamieson & Son .. | 35 10 | ‡7 10 | ‡18 0 0 |

LONDON.—The Westminster City Council has accepted the offer of Messrs. John Mowlem & Co., Ltd., to continue the contracts for :—
Carriageway repairs (granite).
Carriageway repairs (macadam).
Footway and channel work.
Gullies (stoneware) construction.
Sewerage and drainage minor works.

LONDON.—The Westminster City Council has renewed their contract with the Acme Flooring and Paving Co. (1904), Ltd., for carriageway repairs (wood pavement), for a period of six months.

STRETFORD.—The U.D.C. has accepted the following tenders :—

ROAD STONE.

Pwllheli Granite Co., Ltd. (by canal or rail) : Tarred Macadam, ½ in. to 2 in., 20s. 6d.
Berwyn Granite Co. (Stretford Station), six months only : Macadam, machine broken, 2 in., 12s. 11d. ; 1½ in., 12s. 5d. ; 1 in., 11s. 5d.
Pwllheli Granite Co., Ltd. (by canal or rail) : 4 in. Dressed Cubes, 37s. ; 5 in. × 3 in. × 5 in. to 7 in. Setts, 37s.
Berwyn Granite Co. (Stretford Station), six months only : ½ in. Chippings, 12s. 11d. ; ¼ in. Chippings and Sand, 12s. 11d.

FLAGS, CURBS, SETTS, &C.

*Flags.*—W. Jackson : Best Barns, 3 ft., 7s. ; 2 ft. 6 in., 7s. Sawn Barns, 3 ft., 7s. 6d. ; 2 ft. 6 in., 7s. 6d. Second Barns, 3 ft., 6s. 6d. ; 2 ft. 6 ins., 6s. 6d.
*Curbs.*—W. Jackson : 12 in. × 8 in., Dressed, 4s. 6d. ; 12 in. × 8 in., Undressed, 3s. 6d. ; 14 in. × 8 in., Undressed, 4s.
*Setts.*—W. Jackson : 6 in. Brown Lonky, 25s. ; 4 in. Cubes, 40s.
*Chippings.*—W. Jackson : ½ in. and ¾ in., 10s.

GLASS AND PUTTY.

*Glass.*—Baxendale & Co. : 21 oz. Plain, per ft., 5½d. ; 15 oz. Plain, 4½d. ; 15 oz. Opal, 1s. 2d.
*Putty.*—Baxendale & Co. : Per cwt., 17s. 6d.

CEMENT.

Hall & Rogers : Per ton, 57s. 6d. (O.T. and Stretford) ; 56s. 6d. (Cornbrook).

LIME AND LIMESTONES.

*Lime.*—Buxton Lime Firms : Per ton, 31s. 9d. (Stretford Station).
*Limestones.*—Buxton Lime Firms : ½ in., per ton, 9s. 8d. ; ¾ in., 9s. 8d. (Stretford Station).

### TO CORRESPONDENTS.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name) ; those relating to advertisements and other exclusively business matters should be addressed to THE BUILDER, LTD., and *not* to the Editor.

## NEW COMPANIES.

The particulars quoted below have been compiled by Jordan & Sons, Ltd., Company Registration Agents, of 116 & 117, Chancery-lane, W.C. 2, from the documents available at the Companies' Registry :—

RYLAND (JOINERY), LTD. (149,948). Registered March 22. To carry on business as timber merchants, wood turners, saw mill proprietors, &c. Nominal capital, £2,000 in £1 shares.

SELF-CENTERING EXPANDED METAL WORKS, LTD. (149,936), 2 & 3, West-street, Finsbury-circus, E.C. Registered March 21. To carry on business as manufacturers of and dealers in expanded metal fabrics and munitions of war, &c. Nominal capital, £50,000 in £1 shares.

L. S. STARRETT CO. (GREAT BRITAIN), LTD. (149, 934). Registered March 21. To carry on, develop, extend and turn to account the business of buyers and sellers and importers of and dealers in fine mechanical tools, machine and engineering tools, &c. Nominal capital, £60,000 in 60,000 £1 shares.

WILLIAM SHEPHERD & SONS (KENDAL), LTD. (149,928). Registered March 21. To carry on the business of shaft and handle manufacturers, wood turners, &c. Nominal capital, £40,000 in 40,000 £1 shares.

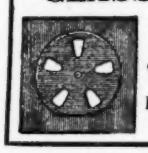
BILLINGS & SPENCER CO. (GREAT BRITAIN), LTD. (149,928). Registered March 21. To carry on the business of buyers and sellers and importers of and dealers in wrenches, machine tools, &c. Nominal capital, £15,000 in 15,000 £1 shares.

FAULKNER, DAVIES & CO., LTD. Registered March 11. To carry on the business of timber merchants, shippers, &c. Nominal capital, £2,000 in £1 shares.

REEVES CHARLESWORTH, LTD. (150,011). Holme-lane, Hillsborough, Sheffield. Registered March 27. To carry on the business of builders and contractors, &c. Nominal capital, £5,000 in £1 ordinary shares.

TURPIN'S
(W. S. Adams, Proptr.)
Asphalte Block Paving, Wood Paving, Wood Block Floors.
For Sheds, Factories, etc.
25, NOTTING HILL GATE, LONDON, W. 11
Estd. 1866. Tel. No., Park 1885. Tel. Ad., "Turpilius, London."

Luxfer Specialities
Luxfer Prisms. Pavement Lights.
Floor Lights. Stallboard Lights.
Roof Lights. Skylights.
Dome Lights. Ceiling Lights.
Lantern Lights. Leaded Lights.
Fire-resisting Glazing.
Roof Glazing. Metal Casements.
Architectural Metal Work.
16, HILL ST., FINSBURY, E.C. 2

Easiest and Safest Way to VENTILATE Offices Shops, Bedrooms, etc., is to have
GLASS VENTILATORS.

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JAMES CLARK & SON, Ltd.,
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SLATE MERCHANTS, LTD.
EXPERTS IN
SLATING, TILING.
STRIPPING AND RELAYING.
Telephone : Avenue 4940 (two lines), or write
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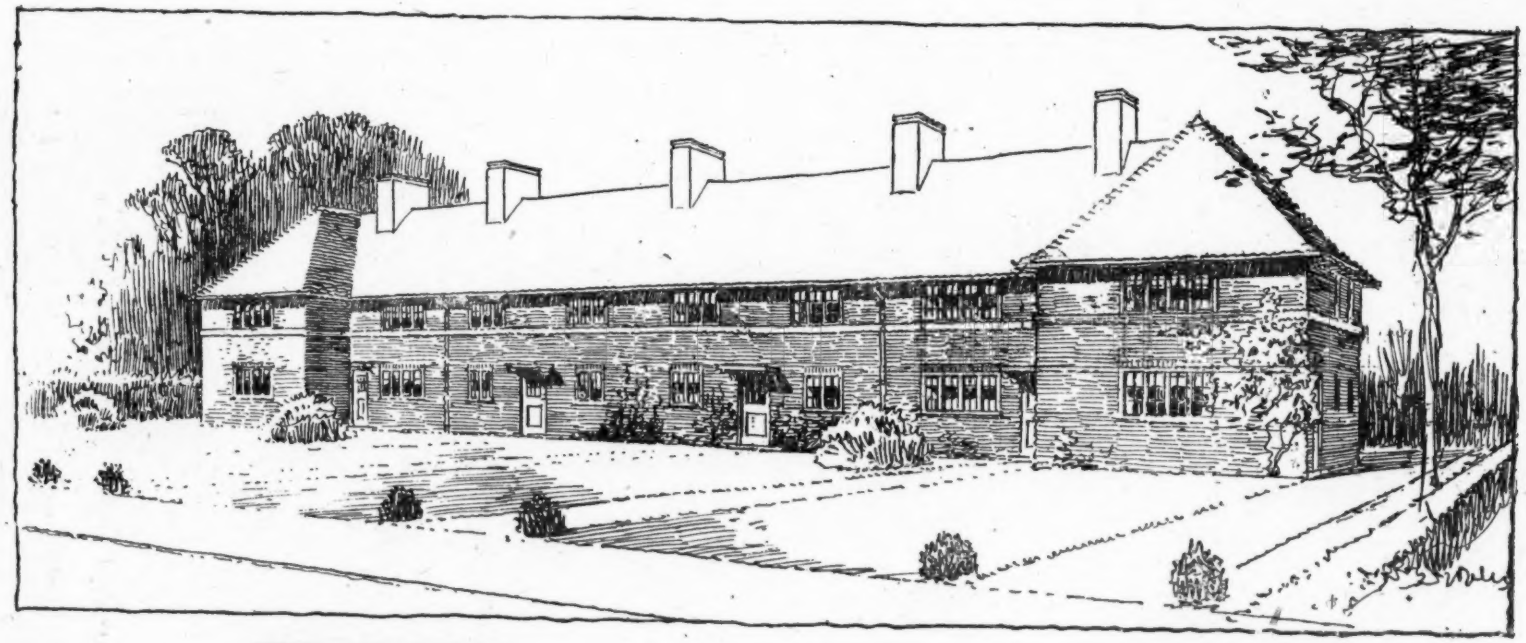
BETHNAL GREEN, LONDON, E.

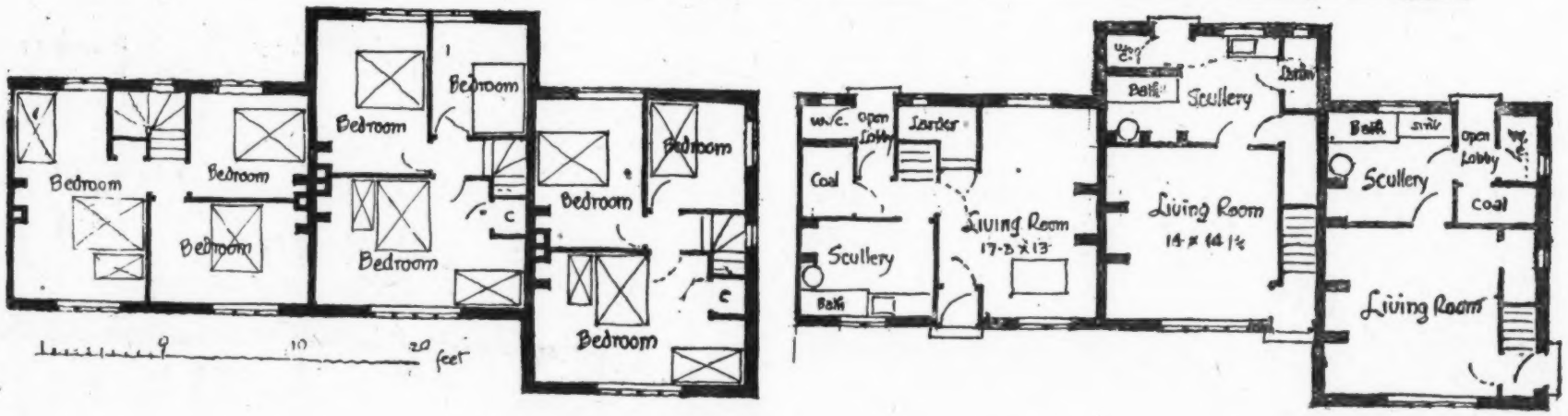
**Asphalte.**—The Seyssel and Metallic Lave Asphalte Co. (Mr. G. F. Glenn), Office, Moorgate Station Chambers, Moorfields, E.C. 2—The best and cheapest materials for dampcourses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to Forth Bridge Co.

OGILVIE & CO., Telephone : DALSTON 1848. Many years connected with the late firm of W. H. LASCELLES & Co., of Bunhill Row.
Mildmay Works, Mildmay Avenue, Islington, N.
EXPERTS IN HIGH-CLASS JOINERY.
ALTERATIONS AND DECORATIONS. ESTIMATES FREE.

W. W. HOWARD BROS & Co
38, TRINITY SQUARE EC3
*Sole Agents for U.K. & Europe for*
WESTERN AUSTRALIAN GOVT
STATE SAW MILLS

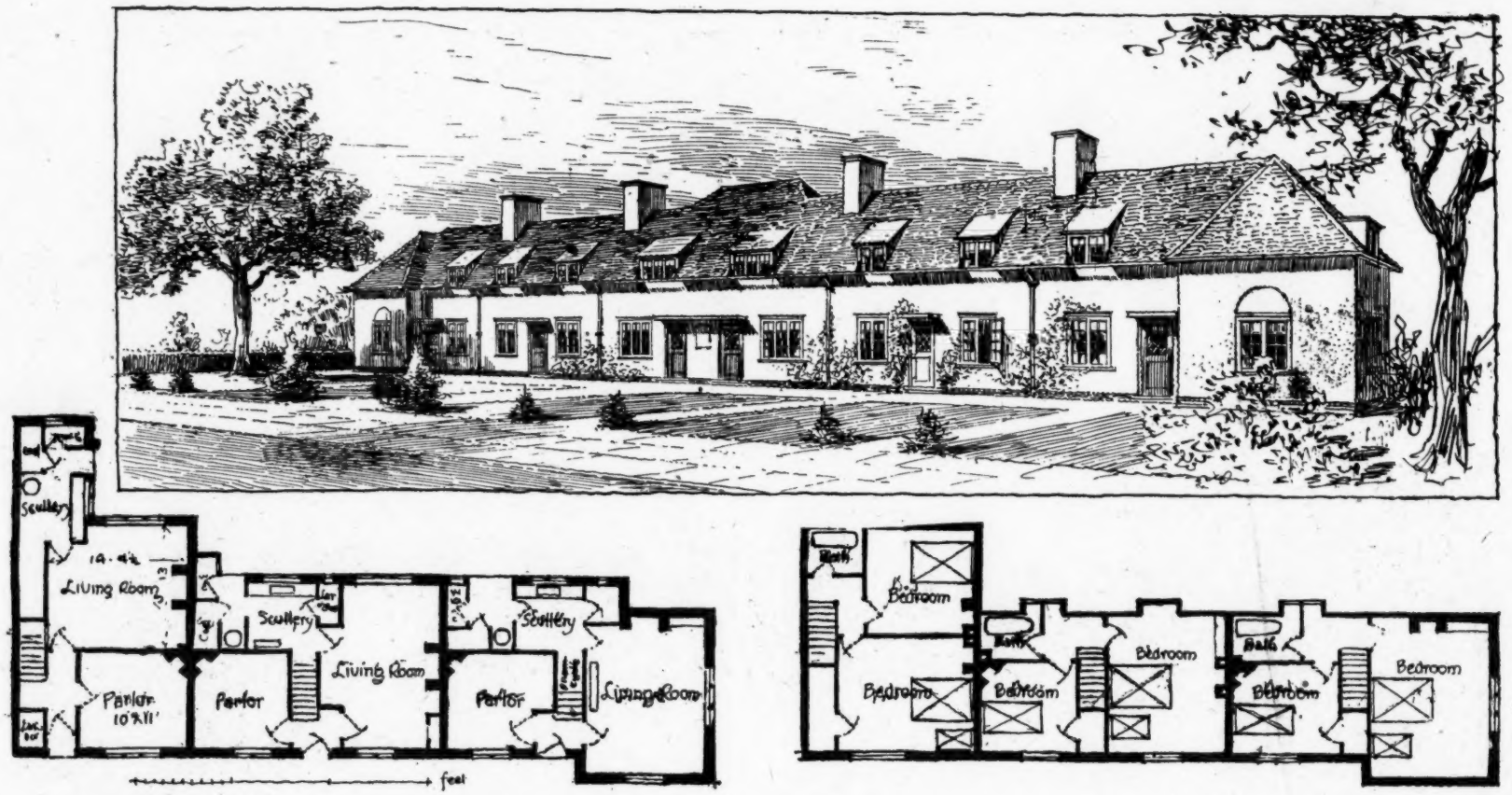
BRC
Fabric





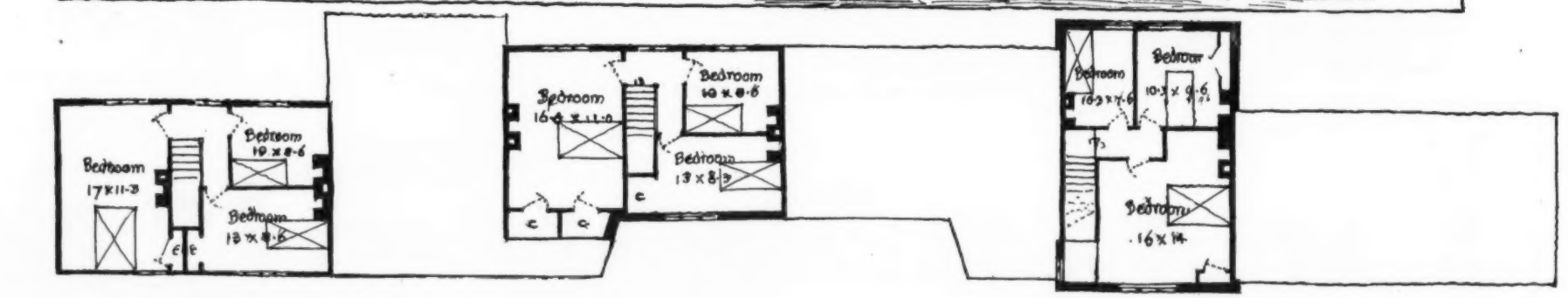

**The L.G.B. & R.I.B.A. Cottage Competition (Home Counties).**

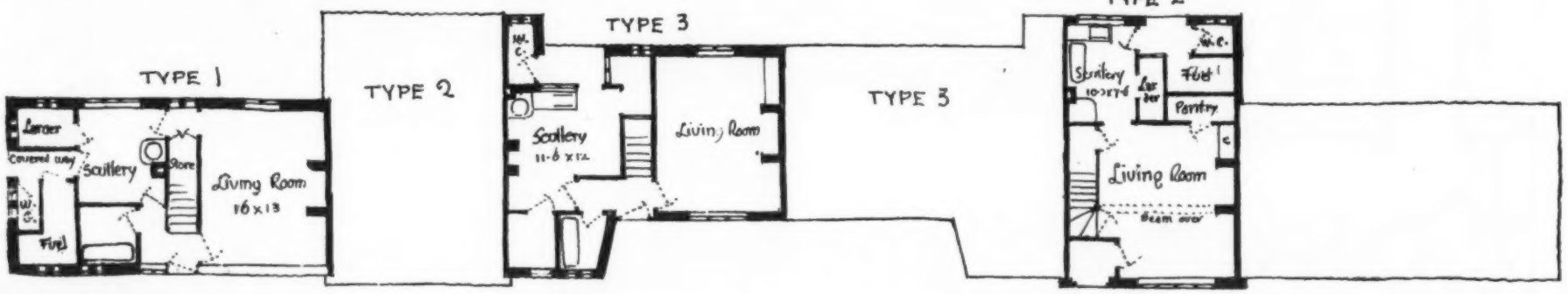
Class A. 2nd Premiated Design, by Mr. F. C. W. Barrett.




**The L.G.B. & R.I.B.A. Cottage Competition (Home Counties).**

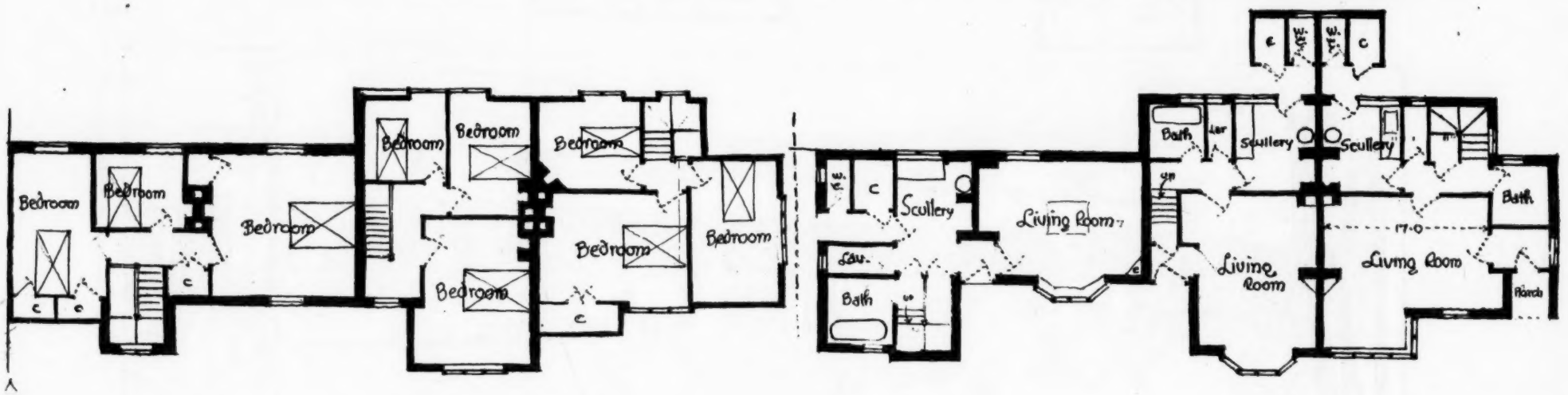
Class C. 1st Premiated Design, by Mr. COURTENAY M. CRICKMER.



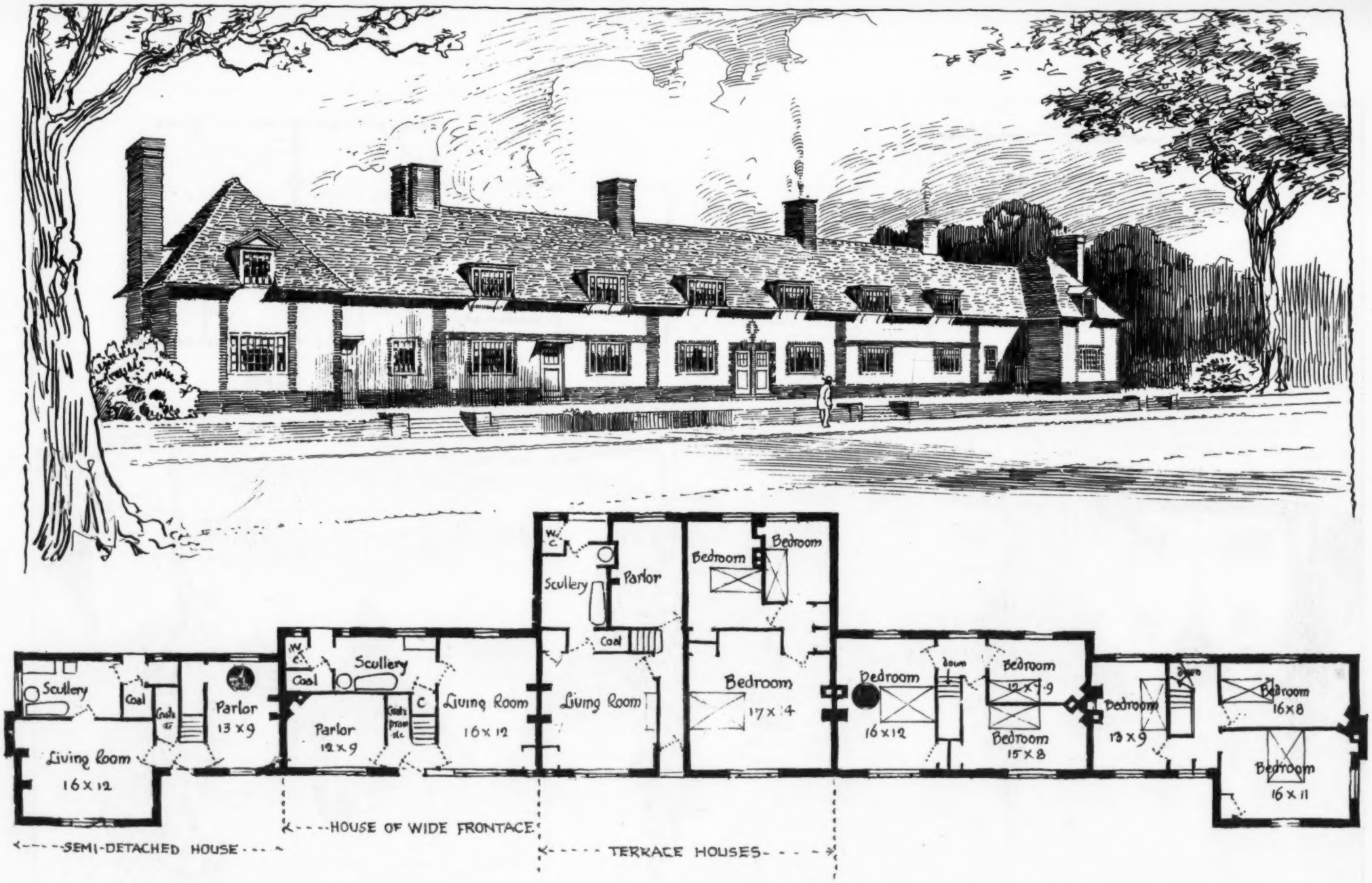

LOCAL GOVERNMENT BOARD AND R. I. B. A. COTTAGE COMPETITIONS. (HOME COUNTIES.)

CLASS A. DESIGN BY MR. A. E. BERESFORD.




LOCAL GOVERNMENT BOARD AND R. I. B. A. COTTAGE COMPETITIONS. (HOME COUNTIES.)

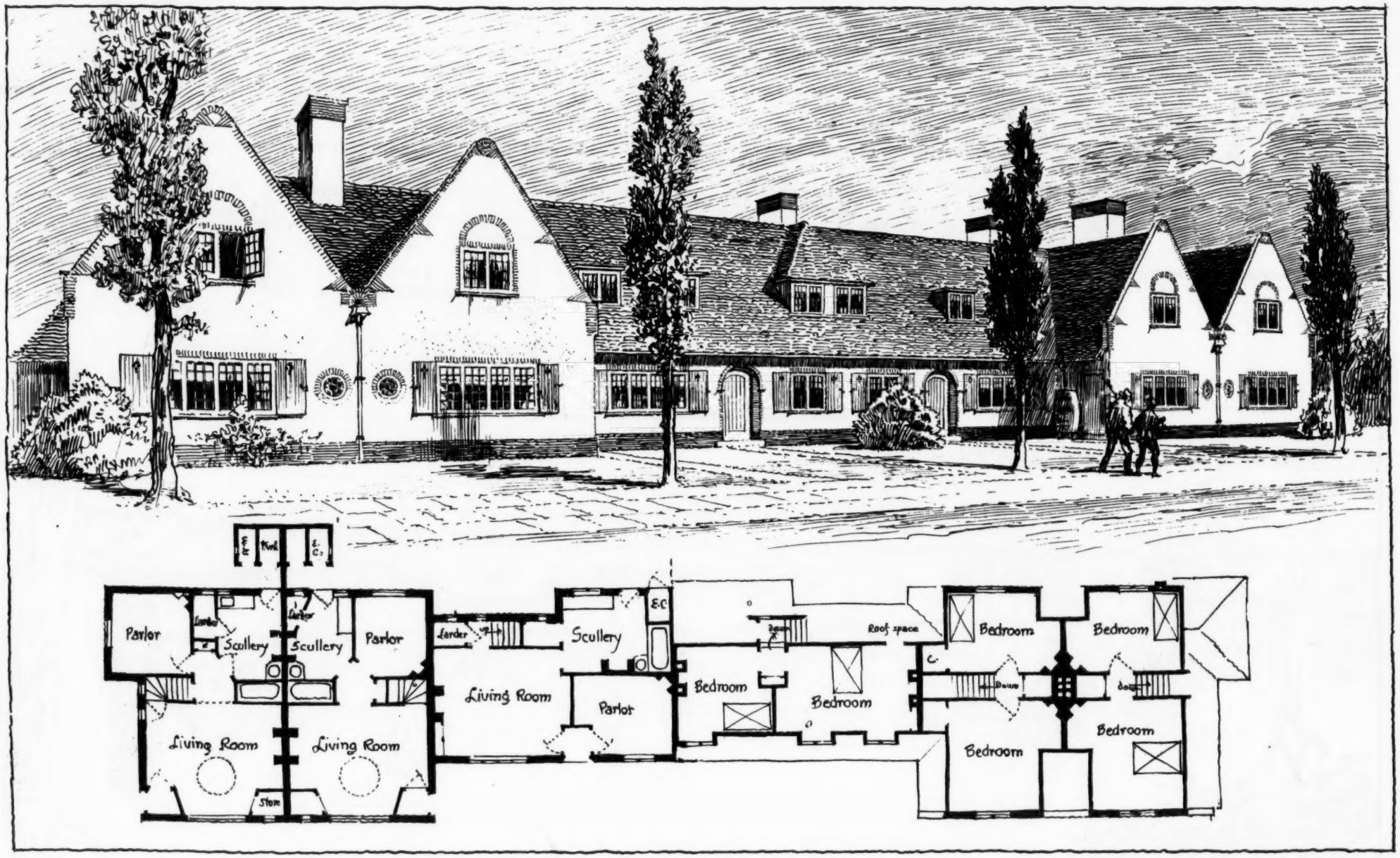
CLASS A. DESIGN BY MR. A. P. STARKEY.




LOCAL GOVERNMENT BOARD AND R. I. B. A. COTTAGE COMPETITIONS. (HOME COUNTIES.)

CLASS B. DESIGN BY MR. ALFRED COX, F.R.I.B.A.

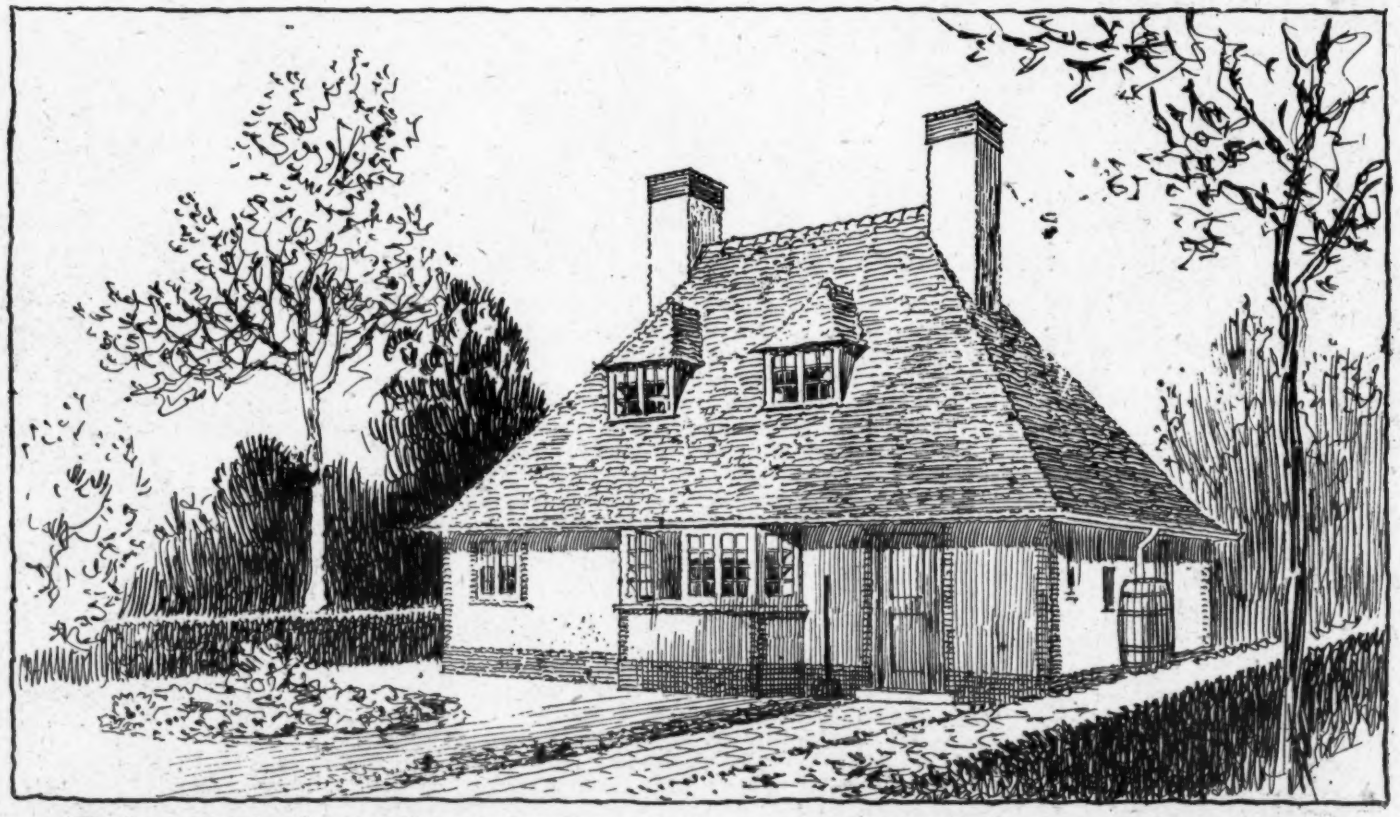
PLACED FIRST.

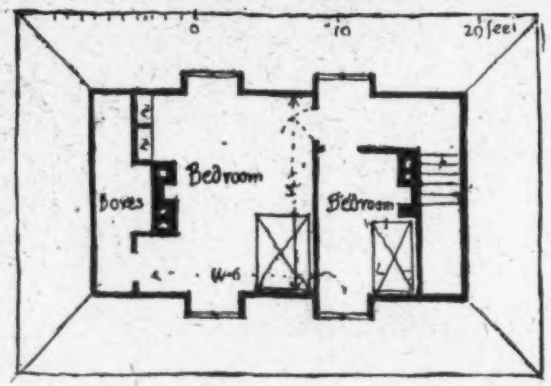


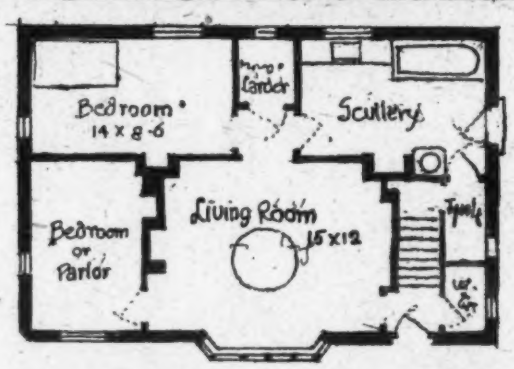

LOCAL GOVERNMENT BOARD AND R. I. B. A. COTTAGE COMPETITIONS. (HOME COUNTIES.)

CLASS C. DESIGN BY MR. C. WONTNER-SMITH, F.R.I.B.A.

PLACED SECOND

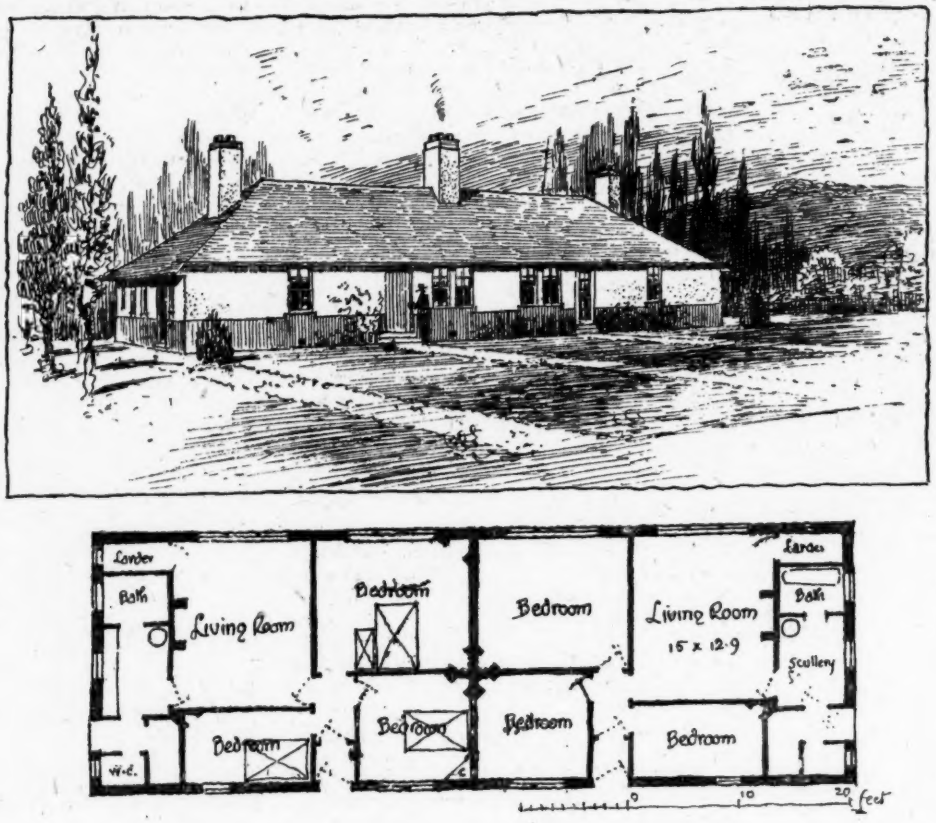




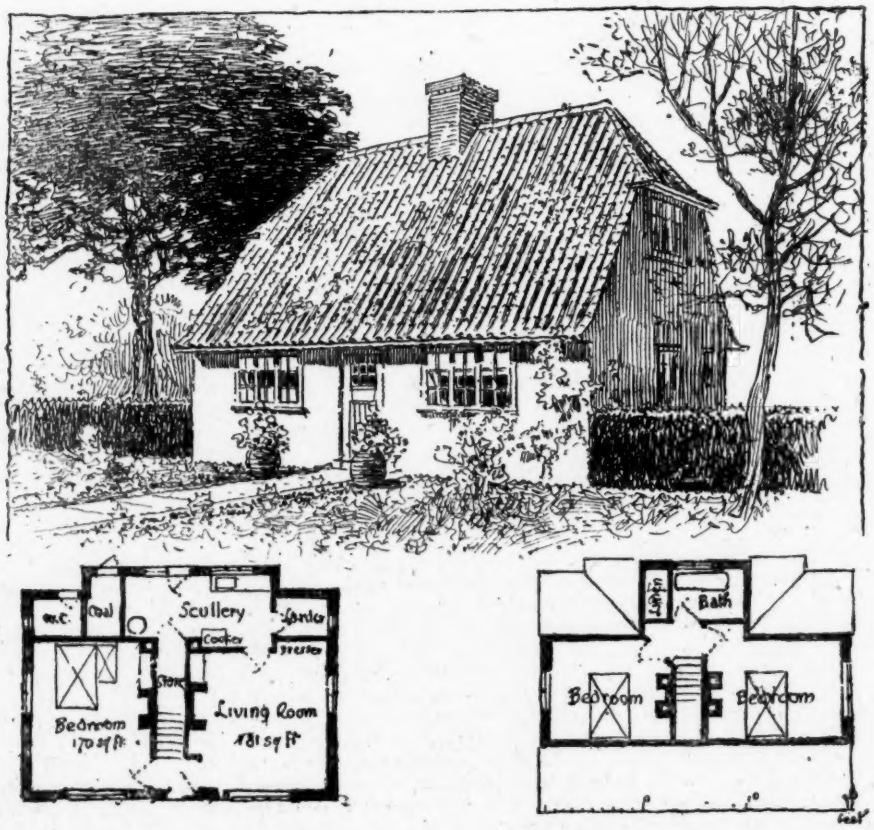




**The L.G.B. & R.I.B.A. Cottage Competition (Home Counties).**

Class D. Hon. Men. Design, by Mr. C. WONTNER SMITH.




Class D. 1st Premiated Design, by Mr. JOHN A. W. GRANT.




Class D. 2nd Premiated Design, by Mr. W. R. MOSLEY.

**The L.G.B. & R.I.B.A. Cottage Competition (Home Counties).**